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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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EDITORIAL NOTES.

As WE are now entering upon the third year of our journal's existence, we may say, that we hope that our readers may find us sparing no reasonable effort or expense to make the REVIEW useful to all classes. We feel that for the common school teacher and the young student we must make an effort for further simplification and condensation in our teaching aids. While for the more advanced we must attempt higher and more systematic outlines. Our work in natural science is not to recast the matter already in our text-books, but to supplement the schoolroom and the learning public with aids for which there are no appropriate text-books. This is one reason why lessons on nature should be made a specialty in educational papers at the present time. We are not confined to any special department of work however. As the demand may vary, so shall we endeavor to secure supply. Our object will be to stimulate the acquirement of practical knowledge, instead of fictitious knowledge; a knowledge found by examining nature, as it is, instead of imagining how it ought to be. The best education is that which makes man the most useful. The highest culture is the one which in the long run makes man the happiest and best servant of his race.

ATTENTION is directed to our advertising columns of this issue. Our readers will find there a variety of interesting matter.

THE programmes of the N.B. and N. S. Educational Conventions will be found elsewhere; also the standards for matriculation to N. S. colleges,

THE closing exercises in connection with the Mt. Allison institutions at Sackville are just over as we go to press. The year has been a remarkably prosperous one, not only to the college but to the academies. The number of students in attendance has equalled if not exceeded that of previous years, and the popularity of these institutions is shown by the numbers who assemble from all quarters to witness the anniversary exercises, the enthusiasm that is called forth on these occasions, the good feeling which exists between faculty and students, and the liberal support which is being extended to Mt. Allison, not only by the immediate friends of the institution but by the public at large in the three provinces. The excellent administration of Dr. Inch and his able assistants makes a still greater success and popularity probable in the coming years.

THE American Institute of Instruction, of which Ray Greene Huling, New Bedford, Mass., is the secretary, will meet this year on July 8 to 12, at Bethlehem, N. H., amid the fine scenery of the White Mountains.

THE general interest aroused by our astronomical articles warrants our giving more careful attention to our astronomical notes than heretofore. The calculations are made specially for the Atlantic provinces; and it is hoped they are just of a kind most likely to be useful to the student desirous of making a practical acquaintance with the elements of this sublime and useful science.

The fifty-sixth annual convocation of the Faculty of Arts, McGill University, Montreal, took place on the afternoon of April 30th. The address of the Principal, Sir Wm. Dawson, was an able review of what the university and its affiliated associations have accomplished in the past for the higher education, and what may and ought to be accomplished in the future.

From Vancouver Island, in rocks designated by Dr. G. M. Dawson as cretaceous, Sir William Dawson finds in addition to other vegetable remains the leaves of a number of the genera of exogenous trees and plants, among which are probably *Ficus, Alnus, Betula, Quercus, Diospyros, Cinnamomum, Ceanothus, Populus, Salix, Proteoides, Juglans, Rhamnus* and *Aralia*.

A species of moss, new to science, has been discovered by a New Brunswick botanist, Mr. J. Moser, who has made a specialty of collecting in this department of our flora. The species in question has been referred to a celebrated Swedish specialist, who pronounces it a new species.

The annual meeting of the National Educational Association of the United States will take place this year at Nashville, Tenn., July 16 to 20.

The Rev. James Anderson, M. A., purposes holding a Summer School for instruction in the Tonic Sol-Fa notation of music and examination for certificates, to continue for twelve days, beginning about the middle of July, at Picton or New Glasgow, N. S.

DALHOUSIE PROFESSORSHIP.

Mr. Archibald MacMechan has been appointed to the George Munro professorship in English History, Dalhousie University. Mr. MacMechan graduated at Toronto University in 1884, taking first-class honors in English, French and German. During the two following years he was engaged in teaching at the Brookville High School and at the Galt Collegiate Institute. In 1886 he applied for and received a scholarship in English and cognate subjects at Johns Hopkins University; and in 1887-8 he obtained a scholarship in the same. He is now concluding his studies leading to the doctorate of philosophy in the Johns Hopkins University. He was elected as having the best testimonials out of a large number of candidates, some of whom are already well and favorably known to the literary world.

N. B. UNIVERSITY ENCŒNIA.

Encœnia at the New Brunswick University will take place at 3 P. M., Thursday, June 20th, when, for the first time in the history of that honored institution of learning, a lady (Miss Tibbits) will appear as a candidate for the degree of B. A.

Prof. Kierstead, of Acadia College, will deliver the Alumni oration. There will be a large number of candidates for the degree of B. A., and several for M. A. Prof. Burwash, of Mt. Allison, will address the graduating class. The Encœnia will thus present somewhat of an inter-collegiate aspect, owing to the senate's action in appointing representatives of the universities of Acadia and Mt. Allison to its examining board. Thus the University of N. B. has been the first to give effect to the broad ideas of a closer collegiate union, which found expression during the session of the Interprovincial Convention last summer.

The board of examiners for the degrees for the present year is as follows:

In Mathematics.—Prof. Harrison, LL. D., Havelock Coy, Esq., A. M.

In Classics.—Prof. Bridges, Ph. D., Rev. Goodridge Roberts, M. A.

In Philosophy.—Prof. Dyde, D. Sc., Prof. Kierstead, M. A.

In Science.—Prof. Bailey, Ph. D., Prof. Burwash, M. A.

In English.—Prof. Stockley, M. A., Prof. Kierstead, M. A.

In French and German.—Prof. Stockley, M. A., Rev. Goodridge Roberts, M. A.

There are seven candidates for matriculation from the Girl's High School, St. John. Matriculation examinations will be held at the Victoria School, St. John, and at the Grammar School, Woodstock, on the 6th, 7th and 8th June.

Degree examinations will begin on the 10th June.

N. B. NORMAL SCHOOL.

It is proposed to organize an Alumni and Alumnæ Society in connection with the N. B. Normal School, to meet annually during the session of the Educational Institute. This is a movement that should win the hearty support and co-operation of all graduates of this institution, and we predict an enthusiastic organization at the approaching meeting of the Educational Institute.

The year just closing has been one of considerable success in the Provincial Normal School, and Principal Mullin and his staff are to be congratulated on their labors, and the excellent work that has been done in all the departments. The enrolment of students is 224. About 170 will be presented in the English department for examination for license, and it is expected that about 80 will seek advance of class, making in all about 250, a larger number than has ever come up at one time for examination for license.

NATURAL HISTORY OF ATLANTIC PROVINCES.

At the suggestion of Frank H. Eaton, M. A., president of the N. S. Summer School of Science, we give the following partial lists of works and papers on the natural history of these provinces. We are glad to learn that a Natural Science Society or Institute has just been organized for Prince Edward Island. The lack of such an institution heretofore will account for the fewer papers in our list referring specially to the Island. In many respects, however, the natural history of our smaller province is more or less included within that of the greater and encompassing provinces. We are indebted to Mr. Ganong, at present of Harvard University, through the kindness of President Eaton, for the New Brunswick list.

MAMMALS.

The Mammals of New Brunswick (an annotated list). By M. Chamberlain, Bulletin N. B. Natural History Society, No. III., 1884, pp. 37–41. [Also, lists by Hind in Rep. Geology N. B.; Gesner, "New Brunswick"; Adams,"Field and Forest Rambles," etc.]

On the Mammalia of Nova Scotia (series of excellent papers). By J. B. Gilpin in proceedings Institute of Natural Science, N. S., from 1864 to 1871. [Also papers in the proceedings of the same institute by Morrow, Gilpin, Hardy, etc., on the caribou, walrus, beaver, orthagoriscus mola, etc., and a "synopsis" by MacKay, in the "Academy." Vol. I., Nos. 2, 3, 4 and 6.]

BIRDS.

Catalogue of the Birds of New Brunswick. By M. Chamberlain, Bulletin N. B. Natural History Society, No. I., 1882, pp. 23–68. [Also lists by Gesner, Adams and others, and several lists of special regions by Boardman, Herrick and others.]

In the proceedings of the Institute of Natural Science, of Nova Scotia, the following papers:

On the Land Birds of N. S. By Downs. Vol. I., pt. 3, pp. 38–51; Vol. I., pt. 4, pp. 130–136 (1864–5).

Observations on Sea Birds. By Ambrose. Vol. I., pt. 3, pp. 51–59 (1864).

On some of the Rarer Birds of N. S. By Jones. Vol. II., pt. 2, pp. 70–74 (1867).

On the Eagles of N. S. Gilpin. Vol. III., pt. 3, pp. 202–208, (1872).

Golden Eyes or Garrots in N. S. Gilpin. Vol. IV., pt. 4, pp. 390–403 (1877).

On the Semi-annual Migration of Sea Fowls. Gilpin. Vol. V., pt. 2, pp. 138–158 (1879).

On the Birds of Prey of N. S. Gilpin. Vol. V., pt. 3, pp. 255–269 (1880).

Ornithological Notes. Downs. Vol. VI., pt. 3, pp. 326–38 (1885).

Birds of Nova Scotia (a catalogue). Downs. Vol. VII., pt. 2, pp. 377–385 (1887).

Birds of Pictou (a catalogue). MacKay. "Academy." Vol. I., No. 6.

AMPHIBIANS AND REPTILES.

Lists of Amphibians and Reptiles in New Brunswick. By Adams, in "Field and Forest"; Gesner, in "New Brunswick."

Amphibia of Nova Scotia. EDUCATIONAL REVIEW. Vol. I., pp. 233–4.

Reptilia of Nova Scotia. Jones. Proc. Inst. Nat. Sci., N. S. Vol. I., Part 3, pp. 114–128 (1864).

Notes on the Serpents of Prince Edward Island. Mellish, Proc. Inst. Nat. Sci., N. S. Vol. IV., pt. 2, pp. 163–167 (1875).

FISHES.

Annoted Lists of the Fishes of N. B. Gesner, in "New Brunswick." Perley, Descriptive Catalogue (in part) of the Fishes of New Brunswick and Nova Scotia. Govt. Report, Fredericton (1852).

Synopsis of the Fishes of the Gulf of St. Lawrence and the Bay of Fundy, by Theodore Gill, Canadian Naturalist. Vol. II., (new series). Paper 16 (1885).

In the Proceedings of the Inst. of Nat. Sci., N. S., the following papers:

On the Gaspereaux of N. S. Gilpin. Vol. I., Part ——, pp. 114–128 (1864).

On the Food Fishes of N. S. Gilpin. Vol. I., Part 4, pp. 11–14 and 76–91; Vol. II., Part 1, pp. 104–112; Vol. II., Part 2, pp. 17–26.

Fish of St. Margaret's Bay. Ambrose. Vol. I., Part 4, pp. 33–43; Vol. II., Part 1, pp. 67–76; Vol. II., Part 2, pp. 87–94.

On the Salmon of N. S. Gilpin. Vol. V., Part 1, (1878).

Nat. Hist. and the Fisheries. Reid. Vol. 4, Part 2, pp. 131–137.

List of the Fishes of N. S. Jones. Vol. V., Part 1 (1879).

INSECTA.

Nova Scotian Lepidoptera. Jones. Proc. Inst. Nat. Sci, N. S. Vol. II., Part 3, pp. 78–88 (1868).

Nova Scotian Coleoptera, (by the same). Vol. II., Part 3, pp. 141–155, etc. (1869).

N. S. Diurnal Lepidoptera (the same). Vol. III., Part 1, pp. 18–27 (1870); Vol. III., Part 2, pp. 100–103 (1871).

List of Nova Scotian Butterflies. Silver. Vol. VII., Part 2, pp. 86–89 (1888).

Object Lessons on Nova Scotian Insects. EDUCATIONAL REVIEW. Vol. I. and II.

MOLLUSCA.

Marine Mollusca of New Brunswick. W. F. Ganong. Bull. Nat. Hist. Soc. No. 6, pp. 17–61 (1887).

Mollusca of Nova Scotia. Jones. Proc. Inst. Nat. Sci., N. S. Vol. VI., Part 3 (1887).

On the Marine Mollusca of Eastern Canada. Whiteaves. Can. Nat. Vol. IV. (new series). Art 6.

ECHINODERMATA.

The Echinodermata of New Brunswick. W. F. Ganong Bull. N. B. Nat. Hist. Soc. No. 7. pp. 12–68.

Stimpson's Synopsis of the Marine Invertebrata of Grand Manan. (Smithsonian contributions. Vol. VI. (1854).

SPONGES.

Nova Scotian Fresh Water Sponges (a synopsis). MacKay. Proc. Inst. Nat. Sci., N. S. Vol. VI., Part 3, pp. 233–240 (1885).

Fresh Water Sponges of Canada and Newfoundland. Transaction Royal Society of Canada, 1889.

Some Marine Sponges. Honeyman. Proc. Inst. Nat. Sci., N. S., 1888, and series of articles in *Presbyterian Witness*, 1889.

CRYPTOGAMIC BOTANY.

Diatomacea of Nova Scotia. Preliminary observations with a list of recent and fossil—MacKay. Canada Record of Science. Vol. I., No. 4, pp. 236–244 (1885).

Marine Algæ of N. B. and N. S. Hay and MacKay. Trans. Roy. Soc., Can. Sect. IV., 1887, pp. 167–174.

Lichens of Nova Scotia, MacKay (classified catalogue). Proc. Inst. Nat. Sci., N. S. Vol. V., Part 3, pp. 299–307 (1880).

Fungi, Mosses and Ferns of Nova Scotia. Many papers in Proc. Inst. Nat. Sci., N. S. and elsewhere, by Somers, Ball and MacKay, Burgess and Macoun.

PHÆNOGAMIC BOTANY.

Preliminary Catalogue of Plants of N. B. Fowler. Bull. N. B. Nat. Hist. Soc., No. 4, 1885, pp. 8–84, with later additions by Hay, Brittain and Vroom.

Catalogue of Nova Scotian Plants. Lindsay. Proc. Inst. Nat. Sci., N. S. Vol. IV., Part 2, pp 184–223, (1875); also, in same proceedings at different date, papers by Lawson, How, Hardy, Somers, etc.

Revision of Canadian Ranunculacea. Lawson. Trans. Roy. Soc., Can. Sec. 4, 1884, pp. 15–90; also several other monographs by the same in the Trans. Roy. Soc., Can. and elsewhere.

Catalogue of Canadian Plants. Macoun. Geol. and Nat. His. Sur. of Can. Parts I., II., III. and IV., (exogens and endogens), published up to date.

GEOLOGY, ETC.

Acadian Geology. Dawson. With numerous subsequent geological and palæontological publications. In New Brunswick numerous papers, etc., by Matthew, Bailey and others; in Nova Scotia, Honeyman and others. Published in Provincial, Canadian and foreign journals, reports, etc.

(Concluded next number.)

FERNDALE SCHOOL.

No. XXIII.—Birds of the Atlantic Provinces and their Feet.

T. Well, what was to be our lesson to-day?

S. You promised to tell us how many kinds of birds were to be found in Nova Scotia, New Brunswick and Prince Edward Island; so that when we see a bird we may know to what kind it belongs.

ANOTHER S. And so that we may know how many of them we know and how many we don't know.

T. Well, I will try to. I will give you the fifteen *orders* of birds I referred to the other day—not the big, Latin names, only easy English names; but we will follow the plan of the American Ornithologists' Union strictly.

S. What is the American Ornithologists' Union?

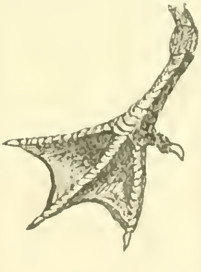
T. It is a society formed of people who know most, study most and write most about our birds; and when these people agree to change the old way of classifying birds, we have good reason to think their way is the best.

S. Does *order* mean a *family* of birds?

T. Not altogether. An *order* includes several families.

Now the first *five* orders of our birds are swimmers. And as the feet are used in swimming, I shall call your attention to the principal different kinds of birds' feet, at the same time.

In the 1st, 2nd, 3rd and 5th orders the *palmate* foot of these two kinds are very common. There is a membrane stretched from toe to toe which is called a *web*, and then the foot looks like the *palm* of the hand. Hence the word.



PALMATE FOOT

It will be noticed that in palmate feet the webs are attached to the toes up to the nails. In the second, not figured here, the web is deeply cleft. In a third kind, not figured here, the web is cleft up to the angle of the toes, leaving flaps or *lobes* of the web attached to the sides of the toes, forming what is called a *lobate* foot. These webs aid the birds in swimming.

Here, then, I write a table of the *orders* on the blackboard, giving the number of species which have at one time or other been found in the Atlantic provinces.

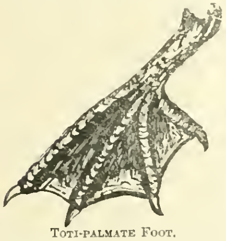
ORDER I.—DIVING SWIMMERS (fourteen species).

It includes three grebes, two loons, three puffins, one guillemot, two murres, two auks and one dovekie.

Order II.—Long-winged Swimmers (twenty species).

This order includes one skua, three jægars, eight gulls, one kittiwake and seven terns.

Order III.—Tube-nosed Swimmers (seven species).


Toti-palmate Foot.

This includes one fulmar, three shearwaters and three petrels.

The next order is characterized by a kind of foot called *toti-palmate*. It differs from the webbed feet of all other birds by having its *four* toes connected by the web. We might call them the toti-palmate swimmers, or

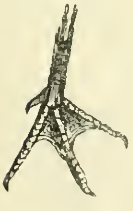
Order IV.—Full Web-toed Swimmers (seven species).

It includes one tropic bird, one gannet, two cormorants, two pelicans and one man-o'-war bird.

Our next order includes our wild ducks and geese; and they are distinguished specially from other birds by having the inside edges of their bills furnished with transverse *lamels* or plates, which form a kind of fringe or strainer by means of which they sift the mud in which they generally seek their food. These lamels are on a larger scale in the mouth of the whale, in one species of which two hundred plates of "whalebone" lamels have been found on each side of the mouth, some of the largest being eight, ten or even fourteen feet in length. The fringed sheets of whalebone in the mouth of the whale appear also to have a similar origin and to serve a similar purpose to those of the birds in this order. It is a very curious point of relationship between such different classes of animals.

Order V.—Lamel-billed Swimmers (thirty-five species).

It includes three mergansers, one mallard, eight ducks, one gadwall, one widgeon, one balpate, three teal, one shoveller, one pintail, one redhead, one canvasback, two golden eyes, one bufflehead, one old squaw, two eiders and three scoters (all wild ducks, thirty-one species), two geese, one brant and one swan.


Semi-palmate Foot.

The next three orders may be called *waders*. The *semi-palmate* foot is common among them, although by no means characteristic. Birds cannot be classed naturally according to their feet alone, any more than by their mouths. A number of points may have to be considered, and often there are cases where the jury disagree, and no wonder. Here, however, we have a semi-palmate foot, just to compare it with the cleft palmates.

Order VI.—Knife-billed Waders (nine species).

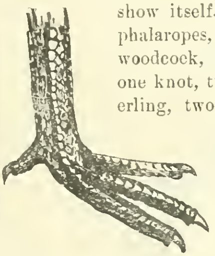
These are sometimes called *stalkers* from their habit of stalking stealthily about. The order includes one ibis, two bitterns, five herons and one egret.

Order VII.—Long-toed Waders (six species).

Sometimes called *skulkers* from their timid habit. They pick up their food from off the surface of the ground and frequent marshy places. The order includes here two rails, one sora, two gallinules and one coot.

Order VIII.—Slender-billed Waders (thirty-six species).

Called *stampers* from a common habit of stamping the soft mud in which they generally feel for their food in order to make their small prey show itself. The order includes two phalaropes, one avocet, one stilt, one woodcock, one snipe, one dowitcher, one knot, twelve sandpipers, one sanderling, two godwits, two yellow-legs, one willet, one ruff, three curlews, four plovers, one killdeer and one turnstone.


Rasorial Foot.

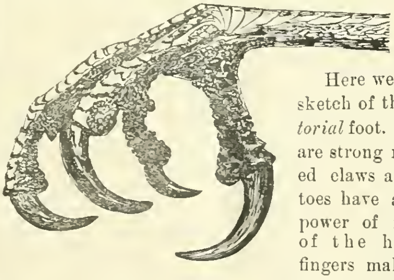
Here is a sketch of a *rasorial* foot—one adapted for walking and scratching the earth to discover food. It is well represented in the following order:

Order IX.—Terrestrial Scratchers (two species).

Adapted for living on the ground. Includes the Canada grouse (spruce partridge) and Canada ruffed grouse (birch partridge).

Order X.—Arboreal Scratchers (two species).

Adapted for tree life. The passenger pigeon and mourning dove (both rare).


Raptorial Foot.

Here we give a sketch of the *raptorial* foot. There are strong recurved claws and the toes have all the power of motion of the human fingers making it a perfect clutching apparatus.

Order XI.—Birds of Prey (twenty-seven species).

The order includes two vultures (in New Brunswick accidental), ten hawks, one goshawk, two eagles, one gyrfalcon, one osprey and ten owls.

The next order is of curious composition—cuckoos and a kingfisher. They are so unlike that they might be put in different orders; but then, there would be so few in each. We sketch here the *syndactyle* foot of the kingfisher. "*Syn*," together, and "*daktylos*," Greek for finger. The outer and middle toe are in this case joined together for a distance.

SYNDACTYLE FOOT.

ORDER XII.—KINGFISHERS AND CUCKOOS (three species).

The belted kingfisher (very common), yellow-billed cuckoo and black billed cuckoo (rare).

The feet of the cuckoos are more like those of the woodpeckers, whose form of foot is called the *scansorial* or climbing foot, or the *zygodactyle* foot, from *zugon*," Greek for yoke. When grasping, two toes are forward and two backward. We may call it the yoke-toed foot. Many perching birds are good climbers; but they have the perchers foot.

ZYGODACTYLE FOOT (Woodpecker.)

ORDER XIII.—YOKE-TOED CLIMBERS (eight species).

It includes six woodpeckers, one sapsucker and one flicker (all woodpeckers except in name).

ORDER XIV. STRONG-WINGS (four species).

(a) Whip-poor-will and night hawk, *(b)* chimney swift, *(c)* ruby-throated humming bird.

Lastly we come to the greatest order of all—the perching birds. Their foot is called the *insessorial* or perching foot. The hallux or hind toe is capable of being opposed to any of the other toes, like the thumb of the human hand, and the muscles are so arranged as to tighten the perfect grasping hold of the toes on the perch by the weight of the bird itself. Sometimes this style of foot is spoken of as the *passerine* foot from the Latin name of the order, *passeres*.

INSESSORIAL FOOT

ORDER XV.—THE PERCHERS (102 species).

The order in these provinces includes in the *songless perchers* eight, namely, one kingbird, one phœbe, five flycatchers and one pewee. In the *song perchers* ninety-four, namely, one lark, two jays, one raven, one crow, one bobolink, one cowbird, two blackbirds, one meadow lark, two orioles, one grackle, three grosbeaks, one finch, two crossbills, one redpoll, one goldfinch, one siskin, one snowflake, one longspur, fifteen sparrows, one junco, one towhee, one bunting, two tanagers, one martin, three swallows, two waxwings, one shrike, four vireos, nineteen warblers, one ovenbird, one water-thrush, one yellow throat, one redstart, one pipit, one catbird, one wren, one creeper, two nuthatches, two chickadees, two kinglets, three thrushes, one robin, one wheatear, one bluebird.

S. That is 282 different species of birds in the Atlantic provinces.

T. Yes. But some of these are very rare visitors—some even accidental. On another occasion I will give you the names of all the more common birds, and we shall see how near your list of local birds will come to it.

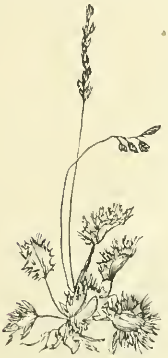
S. Some birds have only three toes, have they not?

T. The most of our birds have *four* toes, a few have only *three*. And I may mention that generally speaking the toes have the following number of joints: first toe, two joints; second toe, three; third toe, four; and fourth toe, five joints. There are a few exceptions in which the joints are one, three, four, five; or two, three, four, four; or two, three, three, three, instead of the normal, two, three, four, five. And, finally, note that the bird walks on its toes. The shanks drawn in our sketches, immediately above the toes, correspond to the instep bones of the human foot. The joint above corresponds to the heel. Its backward flexure shows this much. The joint corresponding to the human knee (with the forward flexure) is always hidden among the feathers of the body. The short thigh bone in the last order, and in addition the most of the leg bone below the knee joint in the first orders, are within the general skin-covering of the body. The bare shank, as we have seen, corresponds to the human *metatarsus*, but is generally spoken of as the *tarsus*; and the first joint above is the heel.

AT Trontro on the Queen's birthday, the statue of the Rev. Egerton Ryerson, founder of the school system of Ontario, was unveiled. Among the addresses delivered on the occasion was one by Dr. Th. H. Rand, D.C.L. The pedestal of the statue is granite from St. George, in New Brunswick—a province which was the first early home of Dr. Ryerson's father and mother, after the close of the American revolutionary war. Dr. Ryerson's mother was a native of New Brunswick.

Plants in the Homes and in the School Room.

Insectivorous Plants.



The cut represents a curious plant which is very common in these Provinces—*Drosera rotundifolia.* It grows on the borders of ditches, by roadsides, in swamps and in wet places generally. In June its round, reddish leaves may be observed, forming a rosette close to the ground. From the surface of each leaf there are numerous hairs or spines, bearing on their tips minute liquid drops which glisten in the sun like so many diamonds—hence the popular name of Sun-dew, which has been given to the plant. But if these minute drops be examined, they will be found to consist of a glutinous substance wholly unlike dew. Later in the summer, in July or August, one or perhaps two scapes are sent up from the rosette of leaves, bearing a raceme of flowers. The plant when fully grown is not more than a few inches high. When first noticed early in June, its rosette of leaves, not more than three or four inches in diameter, lies close to the ground.

But this little plant has been talked about and studied closely by many naturalists; and if all that has been written about it and others of its class were gathered together, it would make a small library. These Insectivorous Plants catch and devour unwary insects. They lie in wait for these, and although they do not dart out and seize them their plans to secure their prey are no less sure and deadly. The drop of glutinous substance on each little hair or spine is sweet and attractive to the insect. Alighting on the leaf he makes his meal, but when he would retire he cannot. The more he struggles the deeper he is imbedded in the sticky substance, while the spines begin to enclose surely with a death-like grip. The sides of the leaf then begin to contract as is shown in the upper leaves of the drawing above, and at the expiration of a few hours the unhappy insect is enclosed in its living tomb. After the leaf has partaken of its meal, which may take a day or more, it gradually unfolds, and its traps are again set for another unwary insect.

This is no fancy sketch. You may dig up a plant, taking care to have plenty of earth attached, and expose in a saucer to plenty of air, for the plant derives its nourishment from these sources, while at the same time it does not object to animal food. Take a small insect, or if your humane instincts forbid you impaling a black fly or mosquito on these deadly spines, a particle of raw beef about the size of a pin head will satisfy the plant's craving for animal food. Then watch the results.

Dr. Hooker, the eminent botanist, sums up the opinions on the Drosera by saying: "The repeated testimony of various observers spreads over a century, and though at no time warmly received, must, I think, satisfy us that in this small family of the Droseraceæ we have plants which in the first place capture animals for purpose of food, and in the second digest and dissolve them by means of a fluid which is secreted by the plant."

Another species of Drosera less common in these Provinces, has longer and narrower leaves than the one figured above. It is *Drosera Americana*, var. *longifolia*. It has the same blood-thirsty character as the round-leaved form.

The relatives of these plants which derive their nourishment in part, at least, from animal food are numerous. Very many plants capture insects but it is not yet certain, in many cases, that they use them for nourishment. Among the latter is the Pitcher Plant, *Sarracenia purpurea*, so abundant in bogs and wet places. The leaves of this family of plants—Sarraceniaceæ—which give them a character entirely their own, are pitcher-shaped or trumpet-like, and are collected in tufts springing immediately from the ground. They send up at the flowering season one or more slender stems, bearing each a solitary flower. The early English settlers in this country gave the plant the name of the *Side-saddle Flower* from the peculiar umbrella-like expansion in which the style or whole flower terminates. Another common name for it is the *Huntsman's Cup*, but ugh! no huntsman would drink the putrefying contents of one of those cups—the open sepulchres where myriads of insects are decaying in a polluted liquor and in a polluted atmosphere. At the top of these pitcher-like leaves there is a gaudy coloring and sweet juices, somewhat intoxicating in their nature, which tempt unwary insects to alight. Leading from this to the receptacle below are numerous hairs, all pointing downwards. The insect, feeding pleasantly and securely on the intoxicating nectar, wanders onward to the brink. If he would return it is difficult, for the hairs point downward, and he is in that happy, don't care mood that leads him to prefer the "primrose path." He reaches the brink and is carried to that "bourne" from which no insect traveller returns. Examine this Pitcher Plant and let the Drosera come in for a share of your attention. They are worthy of it.

ASTRONOMICAL NOTES FOR JUNE.

Short nights make June the worst month of the year for star-gazing. For the month as a whole, and for the Maritime Provinces generally, the average length of the night is only three hours. The length of daylight, twilight and night in the south of Nova Scotia and the north of New Brunswick for June 1st, June 21st and July 1st, is as follows:

SOUTH OF NOVA SCOTIA.

	June 1.	June 21.	July 1.
Daylight,	15¼hrs.	15½hrs.	15⅓hrs.
Twilight,	4½	4¾	4⅔
Night,	4¼	3¾	4

NORTH OF NEW BRUNSWICK.

	June 1.	June 21.	July 1.
Daylight,	15¾hrs.	16hrs.	16hrs.
Twilight,	5¾	6⅔	6⅓
Night,	2½	1⅓	1⅔

The long twilights are good enough for many of the star-gazer's most interesting objects, and daylight is quite sufficiently good for at least one of them.

This one is *Venus*. At the beginning of the month she rises one and three-quarter hours before the sun, and two and a half hours before at the end; and sets about the same time before sunset. She will be easily visible to the naked eye during June at any time between her rising and setting—even in the full blaze of noonday. But the eye must take some little trouble at first in finding out where to look for her. On the 1st she will be 35° W. of the sun and 11° to the South of him. On July 1st she will be 45 W. and 8 S. When you get your first noonday glimpse of her—and the nearer the 6th of June the easier this will be—note her position with respect to some convenient terrestrial object and then you'll have no trouble in finding her next noon. At the beginning of the month only a fourth of her disc is illuminated, at the end she will be a "half-moon." The naked eye won't show you this. But a large telescope is not needed. An instrument with a two-inch object glass and a power of forty is quite large enough. Less will do, but just how much less I don't know. If any of you know I wish you would tell me. If you have an instrument that will show the phases you needn't get up before sunrise to use it. You can have a better view after sunrise than before.

Jupiter is in Sagittarius near the handle of the Milk Dipper. At the beginning of the month he is near Lambda Sagittarius the middle star of the handle. Near the end of the month he will be on the handle and half-way between Lambda and Mu. On the 1st he rises about 9.20 P. M. (mean time), and about four minutes earlier each succeeding night. He is at his best for this year during June and July, and so gives a good chance for a sight of his moons. All four of them can easily be seen with such a glass as that mentioned above. But almost any kind of a glass will show at least one. The easiest one, as a general rule, is the third (III). This one will be well placed for observation on any evening after the middle of the month except the 22nd and 29th. The best evenings for it will be the 20th, 24th and 27th.

Saturn is past his best for this year but is still a conspicuous object between Regulus and the Bee-hive, moving slowly towards the former. Its motion during the month will be about five moon-breadths. Note his position in a glass with respect to the small stars near him, and in a few evenings his motion will be quite sensible.

Uranus may be seen with a good naked eye on any clear night in June when the moon is not too bright and the street lights don't interfere. He is in line with Spica and Theta Virginis, much nearer Theta—so near that Uranus and Theta are easily in the field of an opera-glass. Until the 25th he is moving nearer Theta, after that away from it; but his motion is very slow, its total amount for the month being less than half the breadth of the full moon.

Mercury will be too difficult an object to catch during June, although at the beginning of the month he will be above the horizon for over an hour and a half after sunset.

Mars is too far off, too faint, and too near the sun. He will be of little interest to any one on the earth for the next three months at least. But just wait until next June.

The *Moon* will go her usual round this month, occulting the usual number of small stars. An eclipse and a couple of planetary occultations are also on the programme, but not for our corner of the globe. On the 14th she will occult Jupiter, but Mexico and the adjacent regions will get the benefit of that. On the 24th she will occult Venus, but to see this well one would have to be out on the southern ocean between the Cape of Good Hope and the Antarctic Circle. On the 28th she will eclipse the sun (an annular eclipse), but it will be for the benefit of South Africa chiefly. Before the end of the year our provinces may come in for a small share of these entertainments.

C.

PROFESSOR BROOKS, director of the Smith Observatory, New York, has obtained several observations of the new white region on Saturn's ring, and announces his discovery that the light is variable and that pulsations of the light at irregular intervals have been detected by him. This evidence of a change in Saturn's system is of the highest scientific interest.

For the EDUCATIONAL REVIEW.]

Foreshadowed Changes.

I noticed with pleasure the appearance of "Foreshadowed Changes" in the last REVIEW. I think they do not go far enough.

The Course of Study for High Schools is adapted to the wants of those who wish to prepare for College; it is also adapted for those who will not pursue their studies beyond the High School; but as it differs so much from the syllabus for Teachers' Licenses, those who wish to prepare to teach must experience neglect.

It is proposed that the awards of the Annual Provincial Examination be merely certificates of scholarship. I would like to see the High School Course take the place of the syllabus now in use, and the three grades of certificates be for the three years respectively. No restriction need be put on the age of candidates, but it might be made compulsory that applicants for the highest grade certificate be holders of the second grade certificate. This would raise the literary standard of teachers of the three grades. If applicants for the highest grade be exempted from the proper work of the second grade, they would have more time to devote to advanced work in their grade. The standard of the second grade would be advanced in the subjects of English, History, Science or Classics; while that of the third grade would be raised in every subject but Algebra.

To obtain professional qualification of the lowest grade, the age limit might be as at present, and an optional course in Didactics be given in the first year; but for the other grades, let there be Normal School training, with a certain age limit. If a lack of teachers should result, some modification might be made, such as suggested.

These changes would enable the Normal School to do better work, and the rank and file of our teachers would be better, both professionally and in their literary qualifications. Neither the regular High School pupils, nor those trying for licenses would necessarily be neglected.

Some who pass through the High School at an early age might under such conditions be induced to become teachers, whereas now they are practically prohibited.

The educational authorities would have to designate the optional subjects to be taken in each year, thus doing away with options in the High School, in my opinion, a change in the right direction, often made by the teachers.

This would also make the school year end at the summer vacation, and make it necessary to have the entrance examination just before the vacation. If a second entrance examination is required in the year it might take place before the Christmas vacation. This would do away with the period now found after vacation, when long, tedious reviews make work drag. New work should be taken up at such a time. Also the crowded state of the schools before vacation and the small schools immediately after, until November, would be a thing of the past.

There would be the work of only one year between the various grades, and we would see more trying to obtain an advance in grade. We would also see persons starting out with the highest literary qualifications, and passing through the other steps to the highest professional qualifications.

These are some few reasons, which I think must appeal to all who are in the work, and receive their endorsement. If any one thinks these reasons are not sufficient to demand such changes, let him say so.

Yours truly,

Nova Scotia. H. F.

Selected for the EDUCATIONAL REVIEW.]

Intelligence and Courage of Dogs.

A gentleman connected with the Newfoundland fishery had a dog of remarkable intelligence and fidelity. On one occasion a boat's crew in his employ were seen to be in circumstances of great danger. They were near a line of breakers, outside of the harbor, over which the waves were dashing in great fury. The danger of passing those breakers was so great that the men, brave as they were, did not dare to attempt it. A crowd of people stood watching them on the shore with great anxiety, but could do nothing to help them. Much time had passed and the danger was increasing every moment.

Standing with the people on the shore was the fishery master's great Newfoundland dog. He seemed to understand what the danger was. Presently he ran to the water, jumped in, and swam towards the boat.

He soon made his way through the surf and the men in the boat saw him coming near to them. At first they thought he wanted to get into the boat, but it soon became evident that that was not his purpose. He did not come near the boat but kept swimming round it. While doing this he looked earnestly at the men and would whine from time to time. The men wondered what he wanted. At last one of them cried out "Give him a rope, that's what he wants!" The rope was thrown, the dog seized it in his mouth, and then turned round and swam towards the shore. The men waiting there took hold of it and began to pull it in, and in a short time the boat, with its crew, was hauled through the dangerous surf, and the men on board of it were landed safely on the shore. And so the lives of the boat's crew were saved by the intelligence of a noble dog.

Carlo was a very brave dog, belonging to one of the leading citizens in a New England town. He was very much thought of both by his master and all who knew him. An intimate friend of his master gives this account of him:

Carlo was in the habit of attending all the fires in the town. He could mount a ladder like a fireman, and I remember his adventures with great interest.

Once, on a public holiday, there were but few people about, as most of the citizens were absent on a popular excursion. Towards the close of that day the bells of the churches began to ring very loudly, as they always did when there was a fire. Carlo had been guarding the house and sleeping lazily. As soon as he heard the bells ringing he knew that there was a fire. Starting suddenly up he gave two or three loud barks to summon his master, and then started off as fast as he could run for the fire. On arriving there he went to work at once, and busied himself very usefully all the time, dragging downstairs with great speed and care articles of every description.

As the last house in the row was burning the cry of a child was heard in the upper story. It was impossible for any one to make his way up the stairs and expect to get back. Carlo had heard the child's cry and seemed to take in the situation at a glance. Knowing in his dog's mind that the lower stories were all in a blaze he rushed to the ladder, climbed hastily up till he reached the third story, and then jumped in through the window. The fire and smoke soon drove him back to the ladder. His master saw him at that moment and shouted to him to try again, and the people cheered him loudly. He evidently understood what his master had said, for he entered the window again and disappeared for some time. Then the anxious people began to give up all hope for Carlo or the child. But finally a loud shout announced his appearance again, bringing the child with him. He managed to get on the ladder. He was terribly burned. Before reaching the ground he fell, still holding on with wonderful firmness to the little child.

The child was not much hurt, but poor Carlo's injuries were fatal. Every possible care was bestowed on the brave dog, but he died the next day.

What a noble example of courage and self-sacrifice.
—*Selected.* F. M. S.

A wide-awake teacher will not let a day pass without repeated lessons in politeness and etiquette. He may not give it this term or name, but it will be so woven into his class illustrations as to carry the lesson in subh s way as to give offence to none, and yet be observed and remembered by all.

N. S. Summer School of Science.

The following suggestions are for the benefit of those who have not yet attended the Summer School of Science:

Commence the study of one subject in Natural Science *at once.* With text-book, microscope and scalpel, collect, examine, classify, experiment, study.

ZOOLOGY. Text-book—*Colton's Zoology.*—Study the specimen—size, color, form, parts of body. Compare with other specimens, note resemblance and differences—habits, useful or injurious: dissect it, examine its parts—head, legs, wings, body, heart, lungs and other organs, draw a diagram of it. Collect a few specimens—classify and mount them.

BOTANY. Text-book—*Gray's How Plants Grow.* Study the text-books and the specimen. Collect a few common plants found in your neighborhood—classify and name them by the use of the key. Draw a diagram of each plant and its parts.

PHYSICS. Text-book—*Gage's Introduction to Physical Science,* preferable to Canadian reprint of Aultin's *Physics.* Perform every experiment: make your own apparatus; record results in note-book; verify all conclusions.

CHEMISTRY. Text-book—*Williams' Introduction to Chemical Science.* Study the text-book. *Experiment.* Many of the experiments may be performed with home-made apparatus. Experiment.

PHYSIOLOGY. Text-book—*Blaisdell's "Our Bodies and How we Live."* Heath & Co. Study the text-book. Examine and dissect heart, lungs, eyes and other organs of some animal. Draw diagrams of them. Study the effect of the proper position of the body, ventilation, food, narcotics and alcohol on the general health.

ASTRONOMY. Text-book—*Recreations in Astronomy,* by H. W. Warren, D. D. Published by Chatauqua Press, 80th Broadway, N. Y. Belcher's Almanac, 1889. Study the text. Name, locate and map a few star groups.

GEOLOGY. Text-book—*Shaler's First Book in Geology.* Study the text-book. Observe carefully the action of water in the brooks in your neighborhood, in wearing away earth in one place and building up in another. Collect, classify and name specimens found in your own locality, such as sand, soils, shales, slates, sandstones, conglomerates, fossils, etc. Form small cabinets for the purpose of exchange.

MINERALOGY. Text-book—*Crosby's Common Rocks and Minerals.* Study the text-book. Collect specimens from the neighborhood, classify and name them as far as possible. Form small cabinets for the purpose of exchange.

Any person requiring suggestions or direction in the study of any one of the above subjects may correspond with the Instructor of that subject or with the President.

EXAMINATIONS, CERTIFICATES, PRIZES AND GENERAL ARRANGEMENTS.

Before the close of the school in each year, each Instructor will hold an examination in the subject of his department, and to those who undergo a satisfactory examination a class certificate will be awarded, signed by the Instructor, President and Secretary.

For examination purposes, the work in each Natural Science subject will be divided into three sections of equal value, as follows: (*a*) Prescribed text-book and lectures; (*b*) Practical and original work, such as dissecting, experimenting, etc., in the laboratory; (*c*) Collections, mountings, apparatus. The purpose of this arrangement is to lay the chief stress on *real* knowledge of a practical character, rather than on knowledge derived chiefly from text-books. The lectures and demonstrations during the session of the school are intended especially to elucidate facts and principles that are more or less obscure, and to exhibit the best methods of teaching elementary science.

All laboratory work will be done by the aid of the simplest equipments, such as are within the reach of the common schools of Nova Scotia.

A prize of $10.00 will be given for the best set, and another prize of $5.00 for the second best set of home-made apparatus adapted for the use of common schools in illustrating the best method of teaching physics and chemistry.

At a public meeting recently held by the citizens of Parrsboro, it was unanimously resolved that four lecture rooms be fitted up as class-rooms, and the rink for public meetings. In addition to this a sum of money was voted to procure chemical and physical apparatus. Parrsboro affords ample hotel accommodation for all visitors. Any information concerning board will be cheerfully given by Principal Craig.

BOOKS. Papers and requisites for those attending the school may be obtained at the Parrsboro bookstore.

EXPENSES. To defray expenses a tuition fee of $3.00, payable in advance, will be charged. One dollar extra will be charged to those who take the course in elocution.

BOARD. Good board may be obtained for $3.00 per week.

REDUCED FARES. It is expected that reduced fares will be secured on all railways and steamers by persons attending the Summer Science School.

APPLICATION. It is very desirable, to facilitate further arrangements, that persons intending to be at the Summer School of Science should make application to the Secretary at an early date—not later than June 1st.

For further information address the President, Instructor or Secretary.

J. B. HALL,
Secretary.

Truro, N. S.

How to Interest Pupils in Natural Science.

We condense from a valuable paper, read to the teachers of York County by Prof. L. W. Bailey, Ph. D., of the N. B. University, some excellent hints on the practical teaching of Natural Science. After noting the great advances in this subject here and elsewhere, and the increasing interest in it, he said:

"When present at the annual examinations of the public schools, I have oftentimes been struck with the great contrast, as regards intensity of interest, on the part both of the pupils and the audience, in the first and second grades, where object teaching plays so conspicuous a part, and that of the higher grades, which deal so largely with mere abstractions It is the practical recognition of these facts, and the continuation of the natural method of teaching which they suggest, which gives to the kindergarten system at once so much interest and value. But why should this system be confined within such narrow bounds? We are all but children in view of the stupendous realities of nature, and the whole world is but one great kindergarten, boundless in its resources, infinite in its variety, and never failing to afford profit as well as recreation to all who would approach her in the right spirit. Permit me briefly to indicate, in a very simple way, some of the paths in which, as it seems to me, her treasures may be sought even by the young, and in connection with ordinary school work"

Dr. Bailey proceeded to show how geography might be made a living study instead of the dull and profitless exercises too frequently given to pupils, by requiring them to memorize portions of text-books. Their observing powers should be quickened by drawing their attention to physical features of their neighborhood, encouraging them to draw maps, and to notice the natural forces at work in the past and at present in forming valleys, hills, plains, etc. Especially may pupils be led to take an intelligent interest in the physical phenomena constantly occurring, which would make geography a study of life-long interest.

"Finally, useful enquiries may be originated of a semi-botanical or semi-zoological kind. As to the distribution of our native plants, the comparative abundance or rarity of different species, their different places and habits of growth—some in shady woods, others in open fields, some on dry hillsides, and others by the sides of water courses, some flourishing on banks of sand, and others again only in the fissures of rocky bluffs; or, in the case of animals, the times of the first appearance of common birds and the changes in their plumage, the ravages of noxious insects, the habits and metamorphoses of insects; the distribution of peculiar forms, such as the cray-fish or the mole, the nesting of birds, the habits of fishes, etc. All of these are subjects in which even the young may be led to take an intelligent interest.

And if we pass to higher grades, would it not be easy to show that the changes which are now going on every where around us, by the action of water, and ice, and frost, and air, by winds and waves, and tides and currents, have similarly been going on through indefinite periods of the past; and that though the effects, in a limited period, may seem altogether insignificant, in time they become very appreciable and are the means by which the whole earth has been to a large extent fashioned and fitted for its purpose as the abode of man. Seeing for example how water transports and at the same time wears and sorts the materials subjected to its action, how the banks and beds of streams are composed of rolled pebbles of sand or clay according to the varying velocity of the current, how these same materials are deposited in the successive and alternating layers as the results of changes in the channel or the effects of freshets, and how, at times, various objects, as metallic implements, drifted logs and leaves, shells, or even the bones of animals may become embedded in such deposits, the student of nature will probably find no difficulty in seeing that much of the material constituting the earthy banks of streams and rivers are of precisely the same character, arranged in the same way, and often holding the same sort of relics, though these, like the intervales of the St. John, and that on which Fredericton rests, are now very rarely, if ever, reached by running water. Thus he will learn that large as some of our rivers may even now seem to be, they formerly flowed in far wider channels and were subject to overflows of which we can hardly estimate the magnitude. Then, going still farther back, from the intervales to the hillsides, and looking at the rocks laid bare by the course of some stream or by the opening of a quarry, he may see that these, too, are composed of rounded pebbles or of sand, hardened and compacted, it is true, but yet unmistakable in their character, and when long exposed to the weather, crumbling back again into their original condition. He thus finds that the hills, too, are largely made of water-formed rocks, and accordingly point to some former past condition of the surface widely different from that with which he is familiar now. In these, too, if he search with sufficient diligence, he may find relics which he will not doubt are relics of former living beings, it may be a stranded leaf, or a log, or a shell, and if these differ, as they probably will, in details of form and structure from those with which he is acquainted, he will be naturally led, as others have been before him, to the inference that the population of the world has changed, and that various kinds of plants and animals which were once abundant on its surface have now disappeared. Knowing, too, something of the kinds of animals which naturally frequent fresh and salt waters respectively—common snails and insects for example as compared with oysters and clams and whales, and finding, as he may do in many parts of the province, rocks filled with remains of salt water forms, corals and shells and crustaceans, he will accept the conclusion as inevitable that these too once lived in the sea, and that old ocean once rolled over the spot where they now lie buried, though that spot may be scores of miles from the present sea coast, and hundreds of thousands of feet above its present level."

But some one may be disposed to say, "Where is the time to be had for all this sort of thing?" Now, in answer to this, if you will look carefully at what I have said, you will see that it makes no drain at all on ordinary school time. It is work to be done not in the schools, but outside of it, work in the open fields, in the flower decked woods, by the running brooks, and around the borders of lakes and rivers, work which will be done in any case so far as the visiting of these is concerned, but which it is only proposed shall be done intelligently So far as the school itself is concerned no more time need there be consumed than what is needed for an occasional comparison of results, the correction of wrong conclusions and the suggestion of new directions for effort. Indeed such work may be made to assist rather than to interfere with the prosecution of other school work. For example, what better or more suggestive topic can be given for a school essay or literary composition than that of the description of the natural features of a landscape? What better illustrations can be given of geometrical forms and mathematical symmetry than are afforded by the crystals of familiar substances, of ice and snow, of sugar, salt and alum? What better means of developing the artistic talent and of encouraging a taste for drawing than are afforded by the natural models of trees and shrubs and flowers? What better methods, as I have already said, of interesting pupils in the facts of physical geography than by pointing out their illustrations in the local features of the district in which it is taught? Or what more forcible comments on the facts of history—modern history at least—than are suggested by the names of familiar places or the occurrence of old landmarks, the marks of former struggles for supremacy, the relics it may be, like the scattered arrow heads and stone axes often found scattered over the fields or turned up by the plough, of the former occupation of the country by peoples or races now extinct. To sum the whole matter up, in the words of an old friend and distinguished teacher, who himself did no small part in bringing about the result to which he refers: "The studies of the school, occupying the child with widely different though indispensable tasks, have, until within a few years, failed to provide the young mind thirsting for a knowledge of nature with any opportunity of useful communion with her works But thanks to the wiser views of our contemporaries, the doors of the academy and the high school are thrown open to admit the odorous breath of flowers, and the melody of birds and the free air and sunshine of the teeming vocal beautiful world, and it is found that the clear refreshing atmosphere, instead of dwarfing the plants of classical and mathematical learning, only nourishes them to a healthier and more vigorous development."

EVERY school in the Dominion should have in it as first essentials the entire Bible, the British flag and an unabridged dictionary.—*J. Robb in Toronto Educational Journal.*

The Zodiac in the Catacombs.

"The prevalence of fish forms," says the St. John EDUCATIONAL REVIEW in the answer kindly accorded to our zodiacal enquiries; "in the ornamentation of Christian tombs in the catacombs of Rome is not likely to have any astronomical signification. The Christians of that time were not likely to have had good opportunities, or even the leisure to cultivate such tastes." We venture to think the REVIEW does not quite take into consideration all the conditions of early Christianity. The theories of the theosophists and mystics of to-day are pushed too far, and they are led away by their exaggerated estimate of analogy, especially in ascribing too much to the solar myth. Nevertheless, they have thrown much true light on the subject. The mass of the world was then Pagan, and that world was thoroughly imbued with solar and consequently zodiacal ideas, and it is well known that the Christian church adapted its festivals to this domination among many other means it used to justify its faith in the eyes of its Pagan fellow-citizens. It is also a fact which we take to be proved, that the more ancient religions were absolutely dominated by the sign in which the sun stood at the vernal equinox. The very idea of the "Lamb of God" was due to this rule, the constellation Aries having been sometimes called the Lamb instead of the "Ram," of which more hereafter. Many high authorities consider that the transfer of the equinox from Aries to Pisces, which was regarded as symbolical of the triumph of the principal of life over the powers of evil, and therefore applicable to Christ, was connected with this recession so definitely that the Messiah was sometimes actually styled the Fish as well as the "Lamb" of God. It therefore became a holy symbol appropriate to Christian tombs as the cross is considered now.—*Halifax Critic.*

DALHOUSIE COLLEGE.

The annual convocation of Dalhousie College took place in the Academy of Music, Halifax, on Thursday afternoon, April 25th. We have space only for the list of graduates and the winners of special honors.

BACHELOR OF ARTS

Allison, Edmund Powell, Halifax, N S.
Brown, Ernest Nicholson, Lower Newcastle, N. B.
Burkitt, Robert James, Athenary, Ireland
Davidson, James MeGregor, Halifax, N. S
Fraser, Alexander. West River, Pictou Co , N. S.
Fraser, John Keir Geddie, Alberton, P. E. I
Frazee, Victor Gladstone, Dartmouth, N. S.
Fulton, Edward, Lower Stewiacke, N. S.
Harvey, McLeod, Newport, N. S.
Henry, Joseph Kaye, Shubenacadie, N. S.
Laird, Arthur Gordon. Charlottetown, P E. I.
McDonald, Robert James, Hopewell, N. S.
Paton, Vincent, Halifax, N. S.
Putnam, Homer, Lower Onslow, N S.
Smithers, Allen, Halifax, N. S.
Stewart Frank Ingram, Charlottetown, P. E. I

BACHELOR OF LAWS.

Campbell, Alexander, Sydney, C B.
Campbell, John A., Truro, N. S
Cummings, Selden Wm , Truro, N. S.
Forsyth, George Ormond, Greenwich, N. S.,
Lovett, Henry Almon, Kentville, N. S.
MeNeill, Albert Howard, Charlottetown, P. E I.
Paterson, George, New Glasgow, N. S
Ross, Henry Taylor, Halifax, N S
Tobin, Thomas Finlayson, Halifax, N. S
Whitford, Joseph Arthur, Bridgewater, N. S.

PRESENTATION OF HONORS

Classics: First rank, A G Laird

Mathematics and Physics: Second rank, R J. Burkitt.

Mental and Moral Philosophy: First rank, A. Fraser; second rank, E. N. Brown.

English and English History: First rank, Edward Fulton.

MEDALS TO BE PRESENTED.

Governor-general's gold medal, to A. G. Laird ; Demill gold medal, to Edward Fulton, presented by president of Alumni Association; Certificate of Short Course in Arts, to Miss Elizabeth H. Stewart.

SPECIAL PRIZES.

The Waverly Prize, C. L. Moore; the Avery Prize, J. K. Henry; the Early English Text Society's Prize, Edward Fulton; the New Shakespere Society's Prize, Miss E. H. Stewart. Valedictory address for graduating class in Arts, by Victor G. Frazee, B. A. Valedictory address for graduating class in Laws, by George G. Paterson, LL. B.

Spelling Reform.

INTERNATIONALITY.—We have several times heard it expressed, How well it would be to have a common alphabet to denote European tongues, especially German, French and English. Such a one will allow comparison of sounds approximately the same. The Paris *Teacher* has been for nearly three years giving samples of English, German, French, Italian, Swedish and Danish, but with alphabets not entirely uniform. With 1889 this has been changed, the same alphabet being used, except for three nasalized vowels. for which typographic forms (*faute de caracteres*) are not yet ready. We consider it useful to compare pronunciation, and thus reach comparative orthoepy. With the alphabet itself apart from this use we are not in love. The question it sets about solving is *to revise and enlarge the Roman alphabet* consistently, so far as may be, with current use of letters by nations now using the unrevised alphabet. It allows correspondents to use what pronunciation they prefer in each tongue, which makes its pages material for study by every one having interest in (even one, as English, or more) modern languages. In English its orthoepy is too colloquial to our notion, yet gives fair average orthoepy for our tongue, with close *e* and *o* considered dipthongs *(ei, ou)*. The best way to get it is to become a member of the "Fonetic Teachers' Association," of which the headquarters are at 6 Rue Labordere, Neuilli-Sur-Seine, France. Ordinary members pay two francs a year and get a copy monthly free. Active members pay five francs ($1) and get three copies.

So says the *Herald of Spelling by Sound*, Toronto, and so say we.

A BAD SPELL.—A clerk wrote out a cheque for $40, spelling it "f-o-u-r-t-y." His employer directed his attention to his error, remarking, "you seem to have a bad *spell* this morning." The clerk replied, "Sure enough, I've left out *gh*."—*Toronto Herald.*

No, it is not. There is, consequently, a steadily increasing number of educated people who reject alien spelling in program, epigram, coquet, filosofy, etc., and spell them as they ought to be spelled.—*Chicago Tribune.*

To the Teachers of District No. 10.

Our Nature Lesson work for summer will be Botany. Helps: "How Plants Grow," EDUCATIONAL REVIEW, and hints in Cumberland and Truro papers.

May.—Plant seeds in boxes, as Beans, Corn, etc. Give simple lessons on leaves and flowers while seeds are germinating. Examine seeds at various stages of growth. When up, show differences between the two great classes, as illustrated by Beans and Corn. See REVIEW for March and April, and "How Plants Grow." Chap. I., Sec. 2 and 119–131.

June.—Complete lessons on Leaves, Stems and Flowers. Begin about the 20th to talk about classification from Grade V. up, using the simpler plants of the season. Alternately with these have simpler talks with small pupils, as going more carefully over May work, or object lessons designed to get children to trace differences in leaves, flowers, stems, etc. Sec. 143–148, 191–197, and Chap. IV.

July.—Dandelion, and other flowers of Sunflower F. examined. Chap. IV. For Dandelion see page 164.

August.—Review, with continued lessons in classification, and study of the season's flowers. Chap. IV. and key with larger ones.

September.—As in August. Smaller pupils bring in leaves of our various trees, point out differences and make collections in scrap book, printing names underneath. Larger ones might make collection of the woods. All study cones of fir, pine, etc.

October.—Fruits and Seed, uses of plants. Chap. II., Sec. 4 and Chap. III.

Three lessons a week all summer; remaining days choose your own nature lessons. Length of lesson, about ten minutes. Wishing you all success.

Sincerely yours,

E. J. LAY.

Amherst, N. S.

EDUCATIONAL OPINION.

Two distinct lines of study not directly professional, deserve to be emphasized in a normal school curriculum. These are Natural Science and Literature. It would be quite out of place to enlarge on this view here, but independent of their practical utility, these studies have a special disciplinary value for the normal school student. They seem to be counterparts of each other,—things and thoughts, nature and man, truth and inspiration.—*Principal Calkin, N. S.*

I DESIRE to bear testimony to the value of the EDUCATIONAL REVIEW among our teachers. A large number of them, however, have not subscribed for it as yet. This neglect on their part is their mistake. It is also, in one sense an injustice to those whose enterprise has placed this comparatively new journal in the front rank of teachers' helps.—*Inspector Oakes, N. B., now Principal Horton Academy.*

ANNUAL should supercede the present semi-annual engagements between teachers and trustees. It is most desirable that the same school should be officially visited twice in the year—the first visit to be made early in the session and the second later on, to note evidences of progress and to see if the suggestions made during the previous visit have been adopted. To give completeness to the system the semi-annual reports of accredited visitors should be invested with more importance than they now receive. Suggestions of an advisory character are not so apt to be acted upon unless it is understood that non-compliance may be visited with the penalty of withholding, in whole or in part, appropriations from the Provincial and County Treasuries.—*Inspector Gunn, N. S.*

IN estimating the quality of the work done it is somewhat difficult to note minutely the ratio of progress from term to term. So much depends upon the teacher, and good teachers, who are capable of working up the intellectual life of dull and sluggish children and arousing an enthusiasm for study are scarce.—*Inspector Condon, N. S.*

The best schools are those whose teachers and trustees conform as nearly as possible to the law and regulations of council. The schools that show the least results for the time and money expended, have no definite aim and follow it. I am impressed more and more with the wisdom of having a definite curriculum of studies for all the studies of the public schools, and believe it will tend to advancement to compel all the government schools to adopt such a course as a basis of work. There are schools—and I regret to report it—that do not attempt the "Oral Lessons" required. I have made a minute of all these cases, and find they include nearly all of my *poor* teachers. They say they cannot teach these lessons, and I suppose they are more than half correct. Any one can hear children read and recite lessons from a book; but those who *think* and *study* can give good oral lessons. Want of time is the excuse given by those neglecting this kind of work; but they find time to attend to much other work not required of them. It is my present intention to make the oral work a specialty in my inspection for a few terms. I do not wish to undervalue text-book work, but I desire oral instruction to have its proper place in all the schools.—*Inspector Roscoe, N. S.*

PERSONAL NOTES.

Allan Pollock Douglas, Principal of the schools of Westville, has resigned to take a position on the staff of the *Enterprise* published in New Glasgow. He was presented with an address, field-glass and a purse. If any of our popular teachers leave the profession, we hope it may be for nothing less than a position on a popular newspaper. They then remain still public teachers; but their schoolroom becomes very much larger.

We acknowledge with thanks the receipt of a Baltimore paper from Wm. R. Fraser, Esq., B. A., describing the opening of the Johns Hopkins Hospital, one of the finest in the world.

Principal McKittrick, of Sydney Academy, has resigned to enter upon the practice of law. He was presented with an address and gold watch by the students and teachers of the public schools.

F. T. MacKeen, Esq., has been appointed Principal of the Sydney Academy.

Jas. C. Shaw, B. A., Classical Master in the Pictou Academy, has been appointed Munro tutor in classics in the University of Dalhousie.

Joseph Kaye Henry, B. A. (Dalhousie), has been appointed Classical Master in the Sydney Academy.

Professor MacGregor, of the University of Dalhousie, sustains the reputation of Canadian science creditably in his correspondence in the New York *Science*.

Professor Lawson, of the University of Dalhousie, ex-president of the Royal Society, has had an interesting article on the Trees of the Halifax Public Gardens in the *Morning Chronicle*, May 16th.

Dr. Honeyman, of the Provincial Museum, read a paper on the invertebrates attacking the Atlantic cables, before the Institute of Science of Nova Scotia. Harry Piers read a paper on the "Stone Age of Nova Scotia"—illustrated from the Provincial Museum.

SCHOOL AND COLLEGE.

Moncton, N. B., is to have a new school building to accommodate ten departments, with basement for playroom in stormy weather.

The N. B. normal school students have collected a fund of $50, with which to purchase the nucleus of a library.

Queen's University, Kingston, Ontario, closed on April 23rd. It is remarkable that the three valedictorians in arts, medicine, and theology respectively, were Nova Scotians; two of them Pictonians, and one a Pictovian. R. M. Phalen, an old Pictou Academy student, from Cape Breton, was the valedictorian in arts; Norman Grant, B. A., Stellarton, Pictou, in medicine; and C. J. Cameron, A. M., New Glasgow, Pictou, in theology.

The degree of A. B. was conferred on the following graduates at the recent closing of Mt. Allison University, Sackville:

William Ayers, Union Road, P. E. I.
Benj. Hedley Balderston, North Wiltshire, P. E. I.
Ephraim Rayworth Chapman, Port Elgin, N. B.
Charles Comben, Petitcodiac, N. B.
Levi Curtis, Blackhead, Newfoundland
Fred. Wm. W. DeBarres, Guysboro, N. S.
Walter Daniel Irwin, Halifax, N. S.
Heber Stockton Keith, Petitcodiac, N. B.
Neil McLauchlin, St. Catherines, P. E. I.
Thomas Benjamin Moore, Sackville, N. B.
Wm. Wheelan Pascoe, St. John's, Newfoundland.
Samuel Willis Prowse, Murray Harbor, P. E. I.
Herbert Warren Sangster, Sackville, N. B.
William Seaman, Minudie, N. S.
Harry Almon Sheffield, St. John, N. B.
Henry Star Theakston, Halifax, N. S.
Thomas Augustine Wilson, Halifax, N. S.

BOOK REVIEWS.

Hulsean Lectures on Christian Re-union, by Rev. John deSoyres, A. M., Rector of St. John's Church, St. John, N. B. This is a neatly printed volume from the press of J. & A. McMillan, St John, containing a series of four lectures delivered to the students of the University of Cambridge, England, in 1886. The literary excellence of these discourses and their broad spirit of religious tolerance should commend them to many readers on this side of the Atlantic.

Physiological Notes on Primary Education and the Study of Language, by Mary Putnam Jacobi, M. D The subjects treated in this interesting volume are: "An Experiment in Primary Education," "The Flower or the Leaf," "The Place for the Study of Language in a Curriculum of Education " This book will be a revelation to those interested in primary education, as showing what may be accomplished by rightly directed efforts and an attempt to understand the mind of a child. For sale by J. & A. McMillan, St. John, N. B.

The Choral Book for Home, School and Church, translated by Friedrich Zuchtmann, Principal of Conservatory of Music, Springfield, Mass., and Edwin L. Kirtland, Superintendent of Schools, Holyoke, Mass., U. S. A., (Boston, U. S. A. Ginn & Co., 1889). This volume of nearly 100 pages is dedicated to "Dr. Eben Tourjee, the champion of congregational singing." The topics are preeminently adapted for congregational purposes; and as the melodies are simple, and the typography perfect, it forms an excellent book for general vocal culture in school or elsewhere. The collection consists of ninety choice choral pieces which have proved their quality by centuries of use in the homes, schools and churches of Germany, the melodies being unchanged by a single note. The particular objects of the book are given as (1) The bestowal upon the home circle of music easily mastered, and containing means of the best musical culture. (2) The introduction to the schoolroom of suitable music for sight-reading, and for the devotional or musical exercises at opening or closing of the Sessions. (3) The restoration to the churches of the ideal music for congregations and the displacement of the light and lively *morceaux* of the opera, obviously unsuited to convey religious sentiment, and impossible of good rendering by untrained masses. (4) The matchless harmonies of these ninety tunes should serve to establish among people, or musicians, the elevated musical idea which was possessed by the masters who composed them and the people who loved them.

Handbook of Rhetorical Analysis, by John F. Genung, Ph. D ; Ginn & Co, publishers, Boston. The design of this book is to furnish materials as aids to the study of literary models. Selections are made from the best authors in English literature, accompanied by notes which are intended rather to elicit and direct study than as a body of information about the text The book seems to be admirably adapted for those who would improve their style by a close study of excellent models.

Homer's Odyssey Books I -IV., by B Perrin. Homeric Vocabulary, by Thomas D. Seymour, M.A. Ginn & Co., Boston, Mass., Publishers. These books, like their predecessor which we recently noticed, the "Hellenica," are beautifully and accurately printed and tastefully bound. In style of workmanship they are all we could desire, and worthy of the author and stimulative to the reader. The notes to the Odyssey are especially good. In general they are such as are calculated to assist the student without precluding effort on his own part. Real difficulties are met and solved in a scholarly manner, but still so as to be intelligible and interesting to the student at this early stage. Peculiar construction, allusions, words of Homeric form, etc., are annotated upon in such a manner as to show that the editor is not only well acquainted with Homeric literature, but that he knows how to make the knowledge available to assist the thoughtful student. We trust that it will be extensively used, for it has many of the features of an excellent class-book.

We cannot say that we have a partiality for vocabularies, either bound with the text or in a separate volume. The vocabulary before us, however, has genuine merits, and will be found helpful by the student. In the treatment of the proper names which occur, the derivations, the words in Latin which correspond to the Greek, the quotation and translation of idiomatic expressions, and in other matters he will find much assistance But we cannot forbear remarking that though the memorizing of the parts of verbs is irksome to most students, and it may appear a more desirable method to confine the attention of the pupil to the parts which occur in the author, and thus give him the verb piecemeal, as it were. This method will, in the end, prove more irritating than the other was burdensome. We have long felt convinced that the more thoroughly the verb is mastered in the early stage, the more satisfactory is the progress in the latter, and that to accomplish this no assistance can compare with that rendered by Liddell and Scott's abridgment.

EXCHANGES.

The *Popular Science Monthly* for June contains several important articles, among which are "Fungi," "Fabulous Astronomy," "Is Christian Science a Craze?" and others. Published by D. Appleton & Co....The *Scientific American*, New York, comes with a weekly summary of scientific news, record of inventions, and reading matter of general interest, with illustrations of the most important articles.... *Garden and Forest*, D. A. Munro, publisher, New York, is doing an important and increasingly valuable work in arboriculture and gardening. Recent numbers have been especially interesting....*St. Nicholas* for June has a finely illustrated story of French Canadian life, the scene of which is laid at the village of Perce, Quebec....The *Forum* for June has very interesting articles on "The Drift towards Annexation," by W. Blackburn Harte, and "Languages in Modern Education," by Prof. J. S. Blackie.... *Wide Awake* for June is a beautifully illustrated and very readable number.... *Germania* is a new fortnightly periodical for the study of the German language and literature, which is of great advantage to students. Published at Manchester, N. H. Subscription price $3.00 a year.

Educational Institute of New Brunswick.

ELEVENTH REGULAR MEETING, TO BE HELD AT THE PROVINCIAL NORMAL SCHOOL, FREDERICTON.

JUNE 26th, 27th, 28th—1889.

Programme.

1ST SESSION, WEDNESDAY AFTERNOON.—Enrolment Election of Officers. Report of Executive Committee. Other business.

2ND SESSION, WEDNESDAY EVENING. Public Meeting. Address of welcome by the Mayor of Fredericton. Addresses by other prominent speakers. Music by a special choir.

3RD SESSION, THURSDAY MORNING. — 1. Paper on "The demand which the Common School is making on the Common School Teacher," by Eldon Mullin, M.A., Principal of the Normal School.

2. Paper on "Composition and Critical Reading *versus* the Formal Teaching of English Grammar," by George U. Hay, Ph.B., Principal of the Victoria and Girls' High School.

4TH SESSION, THURSDAY AFTERNOON.—Paper on "Compulsory attendance at School," by Frank H. Hayes, Superintendent of the Portland schools.

5TH SESSION, THURSDAY EVENING.—Paper on the question "Is the Common School meeting the demand for Practical Education?" by P. G McFarlane, B.A., Principal of High School, St. Stephen.

6TH SESSION, FRIDAY MORNING.—1. Paper on "The Superannuation of Teachers," by S. C. Wilbur, B.A , Principal of High School, Moncton.

2. Paper on "A Programme of School work for Friday afternoon," by George J Oulton, Master of Superior School, Dorchester.

7TH SESSION, FRIDAY AFTERNOON.—1. Paper on "Public School education—Its relation to the Political, Social and Moral tendencies of the Times," by Philip Cox, B.A., Principal of Harkins School, Newcastle.

2. Election of Executive Committee.

8TH SESSION, FRIDAY EVENING.—Paper on the question, "What provision might be made for Technical Education in the Province?" by W. S Carter, M.A., Inspector of Schools, St. John

Arrangements have been made for discussions to follow the reading of the several papers. The names of the leading speakers will be published later There will be opportunity for the introduction of business at several of the sessions. The usual travelling arrangements will be made.

HERBERT C. CREED,
Secretary.

NOVA SCOTIA
Provincial Educational Association.

The next Annual Meeting of the PROVINCIAL EDUCATIONAL ASSOCIATION will be held in TRURO on Wednesday and Thursday the 10th and 11th of July, 1889.

A very full and excellent programme has been prepared for the occasion. Subjects of special interest at the present time have been selected and they are to be treated by able and successful educationists, viz :

Some Phases of Modern Educational Progress, by D. Allison, LL.D , Superintendent of Education.

Our Common Schools, by Hon. D C. Fraser, M. E. C., New Glasgow.

The Course of Study, by F. H. Eaton, M. A., Provincial Normal School.

"*Civics*," by Prof. Tufts, Cambridge.

Academy Diplomas, by George Miller, Esq , Hantsport High School, and N. C. James, B. A., Prof. Modern Languages, Halifax Academy.

Duties of Principals, by E. McKay, B. A., New Glasgow High School.

Transfer Examinations, by H. S. Freeman, B. A., of Amherst Academy, and A. Cameron, B. A., of Yarmouth Academy.

Kindergarten in the Primary School, by W. R. Campbell, B.A., Truro Academy, and Mrs S. Patterson, Truro.

Music—Tonic Sol-Fa, by Rev. James Anderson, B. A., Musquodobit.

Arithmetic in the 1st and 2nd Grades, by Miss N. E. Church, Normal School Medalist.

Language in the 3rd–6th Grades, by Miss N. A. Burgoyne, Windsor.

A "Model School" class which had the advantage of a short course of training in the staff notation from the highly talented teacher of music in the Normal School, will exhibit the results of *six weeks' teaching* in Tonic Sol-Fa by Miss W. G. Crowell.

Sergeant-Major Bailey, Instructor in Calisthenics in Dalhousie College expects to exhibit a class which he is training specially for the occasion. His course has commended itself to competent judges as being very comprehensive and adapted to the requirements of the school room.

A Public Educational Meeting will be held on Wednesday evening. The Rt. Rev. the Lord Bishop of Nova Scotia and other distinguished speakers will address the meeting.

The usual reductions in Railway fares may be expected—free return tickets except in one or two cases in which the return is one-third.

A. McKAY,
Secretary.

Halifax, May 20, 1889.

MATRICULATION STANDARDS IN CLASSICS
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AND
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FOR 1890 (TO BE USED 1889–90).)

LATIN SUBJECTS:

(1) Cæsar *de Bell. Gall.*, Books II. and III.
(2) Virgil, *Æneid*, Book II.

For ordinary matriculation Dalhousie will accept either (1) or (2). In addition to (1) and (2) Acadia will require Cicero *Pro Archia*.

GREEK SUBJECT:

Xenophon. *Anab.* Book IV.

Dalhousie for Munro Exhibitions and Bursaries will require also Xenophon *Anab.* Books V. and VI.

LATIN PROSE COMPOSITION:

Bradley's Arnold, Exercises 1–44.

Dalhousie for Munro Exhibitions and Bursaries will also require *Greek Prose Composition* as in Fletcher and Nicholson (A. Baillie, Kingston, Ont.) Exercises 1–28.

FOR 1891 (TO BE USED 1890–91).

LATIN SUBJECTS:

(1) Cæser *de Bell. Gall.*, Books II. and III.
(2) Virgil, *Æneid*, Books II.

For ordinary matriculation Dalhousie will accept either (1) or (2). In addition to (1) and (2) Acadia will require Cicero, *Pro Archia.*

GREEK SUBJECT:

Xen. *Anab.* Book V.

Dalhousie for Munro Exhibitions and Bursaries will require also Xen. *Anab.*, Books VI. and VII.

LATIN COMPOSITION, &c.;

As for 1890.

MCGILL UNIVERSITY.
MONTREAL.

The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:-

FACULTY OF ARTS— Opening Sept. 16th. 1889).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 16th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF LAW—(Oct. 1st)
MCGILL NORMAL SCHOOL—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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A. H. MacKAY, B. A., B. Sc.,
Editor for Nova Scotia.

ALEX. ANDERSON, LL.D.,
Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

THERE will be no issue of the REVIEW for August, that month being vacation for most of our teachers. The September number will contain a supplement, giving reports of the educational conventions in New Brunswick and Nova Scotia.

WE want to add largely to our subscription list this summer. The REVIEW has been cordially endorsed at our educational conventions, and will, we hope, receive that material support which it deserves.

THE Encœnia of the New Brunswick University took place on Thursday, June 20th, in the presence of a large number of visitors, who were greatly interested in the proceedings. The year just closed has been a prosperous one, the relations between faculty and students cordial, and the interest on the part of the public increasing.

REDUCED rates have been arranged for on all the lines of travel to the N. S. Summer School of Science at Parrsboro, July 22nd to August 5th.

THE holiday season is upon us; but for our most valued teachers it will not be all merely a playtime. On the 9th July, in Nova Scotia, the Normal School Alumni Association will meet in Truro. On the 10th and 11th the Provincial Educational Association meets to discuss some very important subjects, which we have no doubt will draw together all our speaking and thinking educationists.

ON the 22nd July the Summer Science School meets in one of the most interesting regions of the province—Parrsboro. The attendance last year was very large; but the high character of its graduates, who are much sought after as teachers, and the cordial approval and endorsation of the provincial authorities, as well as the exceptional advantages of the locality, will, no doubt, draw a crowd which will tax the ingenuity of the officers of the institution to accommodate. But they will do it.

THE managing editor, Mr. Hay, sailed for London, Great Britain, on the 25th of June. He will return from his short European tour in about two months. Communications requiring prompt attention should, in the meantime, be addressed EDUCATIONAL REVIEW, Pictou, Nova Scotia.

THE closing day of the Prince of Wales College, Charlottetown, for the academical year 1888-89 occurred on 31st May. The exercises, consisting of teaching by the student-teachers, reading of essays by the students, a valedictory by the graduating class, and the annual report by the Principal, were of a particularly interesting character. Governor McDonald, who occupied the chair, congratulated the students who had obtained an honorable position in the class-lists, and the country upon possessing such an institution as the Prince of Wales College. He referred with pride to the long roll of the names of former students who had distinguished themselves at other seats of learning during the year, and complimented the Principal and his assistants upon the efficiency of the college. Ex-Governor Laird followed with a speech to the same effect. The proceedings terminated with "God save the Queen," sung by the students.

Graduating diplomas were gained by the following students:

1. John McNally, Summerside.
2. Ernest Campbell, Montague Bridge.
3. Andrew Harding, Graham's Road.
4. { Harry Duckmin, Charlottetown.
   { Hedley Ross, Stanley.

Governor-General's silver medal, awarded to the best student—John McNally.

Governor-General's bronze medal, presented to the best student teacher—James Rogerson, Pisquid.

THE closing exercises at the N. B. Normal School took place on Friday, June 7th, in the presence of a large number of visitors including his Lordship the Metropolitan, the Chief Superintendent of Education, professor of the university and others. The work of the term has been very satisfactory. Miss Sarah A. Shenton, A. B., of Woodstock, and Miss Gertrude Hanington, of St. John, were announced as the winners of the Governor-General's silver medals for highest professional standing in the senior and junior classes respectively.

Nova Scotian Bred Carp.

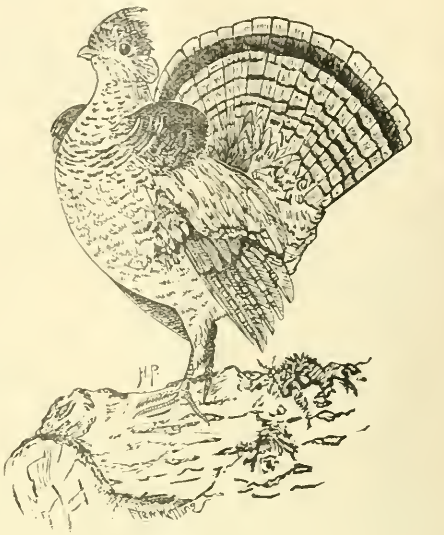
A friend visiting Mr. Macdonald's carp pond, near Durham, Pictou, last week, was allowed a cast for carp, in the interests of science. Instantly a three and a half pounder was hooked, and after a short and sharp struggle was finally landed. Its length was eighteen inches, and girth over thirteen inches. Our scientific editor assisted in the gastronomic test to which it was put. The flesh was very white, not so firm as salmon, suggesting shad, with a flavor of trout. It is without doubt a very fine food fish. Frying produced the most delicious form in which it was served up. Mr. Macdonald has millions of young carp in his ponds already, and quite a great number as large as the one we have been discussing.

The Halifax Summer Carnival.

Halifax, the military city of Canada, with fortifications among the strongest in the world, is going to disport itself. The city will be bombarded for a whole day, during which a fleet of warships and all the forts will take part, and large forces of British regulars, Canadian militia and the mariners will be engaged. The thunder of war, let us hope without any of its casualities, will be good object lessons for our teachers. Each day for one week, up to August 12th, will the empire city by the sea attempt to crowd all the sensations which can attract the world within its own beautiful, if not magnificent, circumference. Its public gardens are among the most beautiful in America, and are of no small interest and value from a natural history and educational point of view.

FERNDALE SCHOOL.

No. XXIV.—The Canadian Ruffed Grouse and its Order.



BONASA UMBELLUS TOGATA (300 A. O. U.)

From specimen in Provincial Museum, Halifax, mounted by Downs, in "drumming position."

TEACHER. To what order does this bird belong?

S. It is the "Birch Partridge," and therefore belongs to the "Terrestrial Scratchers."

T. Right and wrong. There are no partridges in the Atlantic provinces. Partridges have *no* feathers on their *tarsi* or shanks: but Grouse have more or less of the shank feathered.

S. This is Grouse, then, as it has feathers on the upper part of the shank.

JIM. "Spruce Partridges" have all their shanks and even their toes feathered. I have seen them often.

JACK. Why, then, they can't be Partridges at all; they are Grouse too.

T. Correctly reasoned. They are both Grouse. And as you have already noticed a difference in the feathering of their shanks you must have also noticed the more conspicuous differences in other respects. Mention another.

S. There is a pair of tufts of blackish feathers on each side of the neck (over twenty feathers in each) and another lower down near the shoulders, in the Birch Grouse, but I don't think there is any on the Spruce Grouse.

T. Very good. These tufts are called ruffs. In our specimen they are very strongly erected, as are the other feathers of the bird, as it is mounted in the position it takes when making that distant, thunder-like noise called drumming. It also has a crest of feathers on its head.

S. What are the best English names for them?

T. For the first, *Canadian Ruffed Grouse.*

S. There are other kinds of Ruffed Grouse, then?

T. O yes. That is why it is named *Canadian.* And the so-called "Spruce Partridge" may be called simply *Canada Grouse.*

S. What are the scientific names, so that we may know them?

T. The Canadian Ruffed Grouse is *Bonasa Umbellus Togata.* The generic name, from the Latin *bonasus*, a "bison," because the "drumming" of the males were supposed to resemble the distant bellowing of the bison. The specific name, from the Latin *umbella,* an umbel or umbrella, referring to the ruffs. The varietal name, *togata*, means dressed in a toga. A second variety is found in the Rocky Mountain regions, and a third on the Pacific coast.

The Canada Grouse is *Canace Canadensis*, the generic name being an old Latin name for a species of game bird, and the specific name means *Canadian.*

Jack. But these birds live on trees. They might be called "*arboreal* scratchers" as well as "terrestrial."

T. Very true. But they are so closely allied in many respects with our domestic fowls, turkeys, pheasants, etc., which are more decidedly terrestrial, that we must put them in the same order.

S. What is the scientific name of the order?

T. *Gallinæ,* which really means "fowl-like birds."

Jack. *Gallinæ* is an easier word than terrestrial scratchers. But all these scratchers' feet are not the same. They have three toes and one back toe (hallux) a little higher up. But in some of the barn-yard fowls there is a long, sharp spur quite high up on the shank. Is this a fifth toe?

T. No. It is called a spur; is useful in fighting as a special scratching weapon, and is generally found in the males, although in some old world species they are even found on the female. In some species two or more are found on each shank of the male. The domestic fowl, pheasant and peacock are the spur-bearing natives of the old world naturalized among us, while the turkey is the only spur-bearing, indigenous native of North America.

S. What is the scientific name of the original turkey?

T. After the wild turkey was taken from America into Europe Linnæus gave it the generic name *meleagris,* which is exactly both the Greek and Latin old name often applied to the Guinea fowl; and the specific name *gallopavus,* from *gallus*, a cock, and *pavo,* a peacock. *Meleagris gallopavus*, from Mexico, is the original of all the domestic varieties of turkeys

S. And what is the scientific name of the original of our barnyard fowls?

T. *Gallus bankiva*, found wild in South-eastern Asia. But as our time is short let us turn to our Ruffed Grouse. How long would the bird be do you think, measured?

S. About seventeen inches.

T. Correct. The Canada Grouse is generally an inch or so shorter. How many quills (rectrices) in its tail? You can easily count them in the position given in our specimen.

S. Eighteen

T. Correct. The Canada Grouse differ not only in the markings of these feathers but in their number, which is generally sixteen You can count some of the quills called primaries in the wing in our specimen.

S. Why are they called *primaries?*

T. Because they are *secondary* ones and *tertiary* ones.

S. Three different kinds of quills in the wing?

T. Yes. Raise the back of your wrist up to your shoulder and try to droop your hand and fingers downward, making a sort of an M shaped figure with the side of the body. Suppose your hand and fingers to be a shaft as long as an arm bone, the three shafts of the arm would then represent the three shafts of a bird's wing when closed. Stretch the arm and it represents the wing stretched for flight. The long, first shaft—representing the hand and fingers—bears the strong flying quills called the *primaries,* and in nearly all birds these are either *nine* or *ten.* The second shaft bears the strong flying quills called the *secondaries*, and the third shaft—corresponding to the shoulder arm—bears the *tertiaries.* These three kinds of flying quills are called the *remiges*, or flight feathers.

S And what are the smaller feathers overlapping or underlaying the quill feathers of the wings or tail called?

T. The *coverts.* There are wing coverts and tail coverts, upper and lower coverts, greater and lesser coverts. Their names are their explanations.

Jim. Do tell us how the Ruffed Grouse "drums."

T. I will. A person who has often watched the performance describes it thus: The male bird, standing erect, generally on a prostrate, decayed tree, which it usually frequents during the season, raises the feathers of its body in the manner of a turkey-cock, draws its head towards its tail, erecting the feathers of the latter at the same time, and raising its ruff around the neck suffers its wings to droop and struts about on the log. A few moments elapse, when the bird draws the whole of its feathers close to its body, and stretching out, beats its sides with its wings in the manner of the domestic cock, but more loudly, and with such rapidity of motion after a few of the first strokes as to cause a tremor in the air not unlike the rumbling of distant thunder. In perfectly calm weather this sound may be heard two hundred yards.

ASTRONOMICAL NOTES.

At 5 p. m. (60′ time) on July 1st we were at our greatest distance from the sun. How many miles? Well, that depends on the value we use for the sun's mean paralax. The English official value is 8″.848. This makes the sun's mean distance 92,381,000 miles, and his distance on July 1st 1,550,000 miles more. Being so much farther than usual from her liege lord, our mother earth will bestir herself in her planetary duty more leisurely than usual. Her mean rate on her annual journey is over 66,000 miles an hour; but on July 1st she was doing 1,100 miles an hour less than that. On August 1st she will be nearly 200,000 miles nearer the sun than on July 1st, and will then be bowling along 135 miles an hour faster.

The change in the length of our days and nights for the next two months is as follows:

SOUTH OF NOVA SCOTIA.

	July 1.	Aug. 1.	Sept. 1.
Daylight,	15¼hrs.	14½hrs.	13¼hrs.
Twilight,	4¾	4	3¼
Night,	4	5½	7½

NORTH OF NEW BRUNSWICK.

	July 1.	Aug. 1.	Sept. 1.
Daylight,	16hrs.	15hrs.	13½hrs.
Twilight,	6½	4¾	3¾
Night,	1¾	4¼	6¾

Mercury will be morning star all July and evening star most of August. The best time to get a sight of him will be before sunrise about July 20th. He will be occulted by the moon July 26th, very close to Mars on the morning of July 28th, but too near the horizon and the rising sun to be easily seen.

Venus was at her greatest brilliancy on June 6th. She will not be so bright again until October, 1890; but she is still bright enough to be seen at noon in a clear sky until about the end of July by any one who has got her well located during June. It will be an easy job to pick her up in a glass on the afternoons of July 23 and August 22, as she will then be near the moon. She will be at her greatest elongation from the sun on July 10th. After that she will begin her long, stern chase after the sun, a chase which will last until next February, when she will again become evening star.

Mars. See June notes.

Jupiter will suffer occultation on July 11th, and again on August 7th; but on both occasions the moon will have moved past him before he rises to us. The next time this happens (on September 3rd) the maritime provinces will be favored with a sight of it. A full notice will be given of it in the next number. In the meantime make a note of the fact that you will miss a very interesting sight if you forget to watch Jupiter and the moon between 10.45 and 11 p.m. (60° time) on September 3rd. On July 1st Jupiter was on the meridian at 11.30 p. m. (mean time) and will be at the same place at 9.15 on August 1st. He rises about 4¼ hours before that. He is still moving west in Sagittarius, and will do so until August 25th. After that he will wander eastwards until next June.

Saturn is getting into the worst position for observation. On July 1st he set about two hours after the sun, on August 1st about 40 minutes after. For position in heavens see June notes. On August 16th he will pass to west side of sun and become morning star. He will then be nearly 200 million miles farther from the earth than he was six months ago.

Uranus is also increasing his true distance from the earth and decreasing his apparent distance from the sun, and is now too difficult an object for the average eye, but may still be easily seen in a field glass pointed at Theta Virginis.

There will be a partial eclipse of the moon on the afternoon of July 12th. The first contact with the penumbra will occur at 2.35 (60° time). At that time in our latitude the moon will be rising at Venice. The last contact will occur at 7.13, when she is rising over the Banks of Newfoundland. No part of the eclipse will be visible to any part of the North American continent, but nearly all the rest of the land surface of the globe will see some phase of it.

The new moon, which is going to be born on July 27th, will be about twenty-four hours old at sunset on the 28th. It is pretty generally supposed that so young a moon cannot be seen by the naked eye. With a clear evening on the 28th and a little trouble taken to find out where the moon is, the soundness or unsoundness of this supposition can be determined. There is a naked eye (of good average quality but nothing more) within about ten inches of this page which saw last November's moon when she was only 21½ hours old.

OCCULTATION OF JUPITER, SEPTEMBER 3RD.

As the September REVIEW may possibly not be in the hands of all our readers before the 3rd we publish the following predictions:

To the earth generally occultation will begin in British Columbia at 9.13 p. m. (this and all other times in this paragraph are for 60° west longitude), and will end near Cape Sable, in Shelburne County, N. S., at 11.45 p. m. Jupiter will disappear behind the dark limb of the moon. From first contact until final disappearance there will be an interval of two minutes. First contact will occur at Fredericton at 10.50; St. John, 10.54; Dalhousie, 10.55; Charlottetown, 10.56; Yarmouth, 10.57; Halifax, 10.59; Sydney, 11.00. Re-appearance not visible in Atlantic provinces, except in extreme west. At Yarmouth Jupiter will begin to peep out at 11.44½, about five minutes before he sets. C.

For the EDUCATIONAL REVIEW].

FORESHADOWED CHANGES.

I would like to emphasize **a** point made by H. F. in the last REVIEW.

I have seen the course of study for our county academies in Nova Scotia, when attempted to be carried out in them, followed by an exodus of candidate teachers to neighboring advanced schools, to county schools, or to home study, where the high school course could be ignored. Here we see the spectacle of the law encouraging academic education by special provincial grants, and at the same time discouraging them by the lack of a rational co-ordination between the high school course and the syllabus of the teachers' examinations.

The former course was designed, I presume, to give the citizen who could not proceed to the University a well-rounded, general education. The man who intends to be *only* a teacher is not expected, it appears, to have this well-rounded education. The ancient classics and some more modern subjects in the high school course are not at all required to fully equip even the first-class teacher for his diploma.

What wonder is it, then, that we find *firstly*, candidates for teacher's licenses who find that they require all their time for the purpose of cramming subjects that in some cases might be better stowed away in reference books than in their heads, throwing up the regular high-school work and leaving the institution altogether if the prescribed course is enforced. And *secondly*, that the teachers' salary, which is the measure of public appreciation, is becoming lower instead of rising.

If it is a benefit to any class of people to have a knowledge of the structure and vocabulary of the classical languages, it ought to be so to the professional instructor; not for the purpose of teaching them, be it understood, but for the purpose of understanding language and reflecting in speech, ideas and methods a little wider culture than is generally prevalent in the profession. The educational interests of the province, and the pecuniary interests of the profession, both call for some change in the law which handicaps this province even as compared with the smaller province of Prince Edward Island. M. L.

Nova Scotia.

[For the REVIEW.]

N. S. Summer Science School.

Allow me, through the REVIEW, to make the following intimations regarding the Summer Schools, for the benefit of teachers:

1. Ample accomodations for board and instruction will be afforded to all who attend.

2. Applications will be received till July 22nd.

3. Reduced fares to those attending the School have been secured over the following routes of travel:

Minas Basin Route, Spring Hill and Parrsboro, Intercolonial and Eastern Extension, and Steamer "City of St. John." Return tickets on the above one first-class fare.

Windsor and Annapolis Railway and Western Counties Railway, one and one-third fares.

It is probable that reduced fares will be secured on the steamers on Bras d'Or Lakes. Tickets on all the above routes will be good from July 17 to August 9.

4. Persons atending the School will find it convenient to have the following articles: 1 hammer, (weighing about 1 lb.): 1 steel chisel, 6 inches long and ½ inch in diamater; 1 insect net; 1 microscope; 1 cigar box (for holding minerological apparatus) 1 glass ink bottle, cone-shaped with wide mouth—for *alcohol lamp*.

The meeting at Parrsboro, commencing July 22nd, promises to be a large, interesting and enthusiastic educational gathering—a veritable Nova Scotian Chatauqua. For circular or further information, address J. B. HALL, Sec'y. Truro, N. S.

A prize of $30, offered by Colin H. Livingstone, Esq., of New York, as a tribute to the memory of the late Chas. G. Coster, Ph. D., Principal of the St. John Grammar School, will be awarded to the student (male or female) from the Maritime Provinces who passes the most successful sessional examination in McGill University, beginning with April, 1890.

For the REVIEW.

Dumb Animals

We not unfrequently see, in periodical literature, notices of the intelligence of dogs, horses and elephants: and some of the cases are very remarkable. Such a notice appeared in the last number of the EDUCATIONAL REVIEW, selected from some other source. It has occurred to me that undue prominence is sometimes given to the actions of the animals mentioned, calculated to create an impression unfavorable to others The animals specified may in the exhibition of their intelligence more nearly resemble man: hence perhaps in part at best the arrest of our attention and the excitation of our wonder. We marvel to see them act so much as we would in similar circumstances. Other animals have a different way of showing their intelligence: it may not be so demonstrative, but possibly it reveals intelligence quite as unmistakable and strikingly. Cats would not generally be ranked in this respect with the dog: and most persons probably would hold that they are not so affectionate; it has even been said and written that they may manifest an attachment to places and houses, but that they care little for the persons they live with. That this is an unfounded representation, I think could be readily proved, and I would like in behalf of the species to be allowed to give an example known to myself.

I once owned a pretty tabby cat, which was a great favorite in the family. The language of the prophet's parable of the pet lamb would almost apply to her and the treatment she received. Having occasion to change my residence for a distant part of the province, I left the cat in care of a friend and did not see her again for six months. In visiting my former home, puss was one of the first objects I sought and noticed, she did not recognize me at once, but in a few seconds either my appearance or the tones of my voice recalled the past and she purred to me with every sign of affection and delight. After a little she suddenly left me, thinking, as I supposed, that she had showed me sufficient attention. Such, however, was not the case, for she shortly returned with a mouse and laid it at my very feet. It required a good deal of persuasion to induce her to treat herself to the dainty morsel she had procured for me, but at last she yielded. Could she have displayed greater intelligence or affection if she had assumed the more demonstrative manner of a dog? And so will other animals.

Bees, whose sting is generally feared, become even fond of those who treat them with kindness. Mine are as glad to see me as any dog is to meet his master. They certainly are pleased when I go among their hives and tell them of their pleasant useful labors. It is not pretended that they understand such words, but beyond question they rightly interpret the tone of voice in which they are addressed. Squirrels are proverbially timid and shy, but I have had them light on my shoulder as I passed beneath their native trees. All I ever did to gain their confidence was to occasionally throw them a handful of grain, as I visited their accustomed haunts, and to drive away the idle, wicked boys that were molesting them. The merry, pretty ways of squirrels are full of intelligence.

We limit the divine power and goodness when we speak of certain animals as alone manifesting extraordinary intelligence: it is our own ignorance which makes us so think of them, and our folly and loss as well. We might make dumb animals generally our friends by kind and sensible treatment, and thus add an element of happiness to life The pleasure we give to our humble "fellow mortals," as Burns calls one of the class, comes back to ourselves, and is fraught with enjoyment more exquisite in proportion to man's higher order of faculties. The REVIEW is to be commended for its lessons leading to this result —lessons which teachers cannot value too highly.

C. D. R.

Wolfville, June 12th, 1889.

The Bull in the Zodiac.

In continuation of the subject of the sign Taurus, touched upon in an editorial last week, the St. John EDUCATIONAL REVIEW continues:

> "This would seem to indicate that over 2000 B. C. the elements of astronomy had been studied and formulated and even the same idea of nomenclature, in some points, made common to various peoples. It appears to us most probable that the bull must have been worshipped before he was placed in the sky. His position must have depended upon his popular estimation. Once enthroned in the sky, however, the bull's prestige would be in a fair way to be increased."

Assyriology—more valuable to the student of myths to-day than even Egyptology—leaves little question that the elements of astronomy were studied and formulated at a period of even greater antiquity than 2000 B. C. The bull was a very ancient representative of power and strength, and there is no doubt that Ezekiel's cherubims presented themselves to the prophet's mind in the shape of the Assyrian winged bull. It is, as the REVIEW has intimated, not improbable that the strength and grandeur of the bull may have prompted the idea of making it the first sign of the Zodiac. At all events, once there, it is certain that the constellation in which the sun stood at the vernal equinox dominated all religious myths for a period exceeding its actual duration in that sign. The Bible, as well as the Ninevah Library of Esarhaddon and the Assyrian Scriptures, indicate the full sway of bull worship long after the equinox had passed into Aries. But the old Greek myths, as well as the old Roman reverence for the "great twin brethren." Castor and Pollux, *vide* Macaulay's "Battle of Lake Regillus," plainly indicate the reminiscence of a yet older time when religion was dominated by the sign *Gemini*.—*Halifax Critic.*

NATIVE FERNS.

By J. Vroom, St. Stephen, N. B.

There are many wild plants desirable in every respect for garden culture. Among the first which the collector will be tempted to introduce will certainly be the ferns. One or two of these, perhaps, among other plants in a garden, may seem out of place, and for want of proper treatment prove very unsatisfactory. Still, it does not follow that ferns should always be grown by themselves. If a shady corner can be devoted to their culture, and the necessary amount of water supplied, mosses and some of the smaller flowering plants might grow among them to cover the soil and keep up that moisture of the air so needful for their perfect growth. No ill-used plant is more pitiable than a parched and stunted fern. Arrange your ferns so that each will show to the best advantage, and do not crowd them. The larger growing kinds need room to expand their graceful foliage, and a few stately plants well grown will be better than a large number with fronds narrowed and distorted for the want of room.

The nature of the soil and the amount of shade and moisture you can give them will, of course, influence your choice of species. In this, an acquaintance with ferns in their native haunts will be the best guide; yet, the collector will be surprised in some instances to find how easily the plants will accommodate themselves to a change of soil and surroundings, and how their beauty will be increased by the care which protects them from accidental injuries.

Of the evergreen ferns, the Hart's Tongue and the curious Walking-leaf will be planted for their botanical interest rather than for their beauty. Some of the Shield Ferns and Spleenworts are evergreens, and even here in Canada their bright green fronds are found unhurt when the snow disappears. This makes them especially valuable for rockeries. For other purposes their evergreen character may be rather an objection, as the uncoiling fronds of the young growth of the non-evergreen species are all the more beautiful for being seen alone.

Among the best of our native ferns is the Maidenhair. Grown in pots for parlor decoration, no exotic can exceed it in beauty, its only fault being that it needs a season of rest. It is equally desirable for out-door cultivation, and can be grown in masses by itself or in detached clumps, in contrast with stiff and stately Shield Ferns, such as Goldie's Fern and the Male Fern. These all need a rich, open soil, with ample room and plenty of shade and moisture.

Another handsome fern requiring the same treatment is Braun's Soft-prickly Shield Fern. Like the two last mentioned, it grows in the form of a circle or crown. The shape of the upright fronds is particularly graceful, and the golden-brown color of the main stalks is also a conspicuous feature.

The bulb-bearing Cystopteris should be mentioned here as delighting in the same situation. It is remarkable for its slender and graceful form, and for its little bulbs on the back of the frond, from which it takes its name. Unlike most ferns, it is none the worse for being closely planted, so as even to hide the moss in which it grows. It is hard to describe the exquisite beauty of this little fern in its native woods. Looking down upon it where it grows, in the deep shade of deciduous trees, the dull green color and the confusion of shape in the interlacing fronds, making it look soft as a bank of feathers, and as you watch it there seems to be subtle changes in depth of color, like the uncertain movements of Northern lights. When you stoop to gather a few of its fronds, you will find it difficult to choose among them, and will probably destroy more than you take; yet, if you have to pass the spot you will go a long way around rather than crush the frail things by walking through them. This was, I believe, the first North American fern thought worthy of cultivation in Europe. It needs protection from the wind as well as from the sun.

For drier situations the Beach Fern and the delicate and graceful Oak Fern would claim first notice, but they are rather difficult to manage. The Hayscented Fern, or Dicksonia, will bear almost any treatment. The light, feathery fronds take delicate shades of pale green and brown in the autumn, and its pleasant scent is not the least of its recommendations. It is very abundant here in dry pastures and open woods. The perfume seems to attract insects, but I never could find that it is injured by them.

In the wettest place that you can give it the Royal Fern will grow. It, and the other flowering ferns, will beautify an unsightly swamp, or the margin of a slow stream, and make the spot worth visiting. Of other ferns which grow in swamps, the Chain Fern and the New York Shield Fern are worthy of mention; but the most showy, on account of its large size and elegant form, is the Ostrich Fern. In favorable situations it reaches the height of five or six feet. Growing in large, circular tufts, the curving outer fronds form an enclosure or cup, within which rise the curious fertile fronds, very different in shape, which must have suggested the name of the species.

Beside the evergreen sorts above mentioned, there are many other native ferns suitable for rockwork. A collector could not do better than to visit a rocky woodland, and take them up at random. All are interesting, and none of them devoid of beauty.

Selected for the S. P. C. A. Column.

The Captive Squirrel's Petition.

There was a little village maid,
Of manners blithe and free,
A laughing, rosy, playful child
Though born of low degree ;
One evening from the autumn woods
Her doting father brought,
For Janet, home a squirrel brown,
All fierce and newly caught.

Her ruby lips she gently pressed
Upon his velvet head,
And many a backward glance she cast,
As she slowly stole to bed :
Light to her pillow balmy sleep
On downy wing descends,
Her happy spirit to her cheek
Unwonted freshness lends.

And in the visions of the night
The little maiden stole
To gaze upon the living toy
Whose image filled her soul.
As softly she took down the cage,
A cry of wonder broke
From her red lips—in plaintive tones
The captive squirrel spoke—

"Oh, little maiden, pity me,
My home is far away
Where gaily mid the giant oaks,
My bright eyed offspring play,
Their couch is lined with softest moss,
Within an aged tree,
The wind that sweeps the forest bough
Is not more blithe than we ;

"And oft beneath our nimble feet
The old sear branches shake,
As lightly through the beechen groves
Our merry way we take ;
The boundless forest was my home—
How hard my fate must be,
Confined within this narrow cage –
Oh ! set your captive free ! "

That melancholy, plaintive wail
The maiden's slumbers broke,
And with a sudden start and cry
The little Janet woke.
The sinking moon a veil of light
O'er wood and valley spread,
When Janet, full of troubled thoughts,
Rose softly from her bed

With trembling hands she raised the bolt
That held the casement low
The tears were in her lifted eyes
As she bade the stranger go.
'Twas but a momentary grief,
The joy that bless the good
Came o'er her heart—she saw him bound
Like wild bird to the wood

For the REVIEW.

Notes for Teaching Music by Tonic Sol-fa Notation.

Music may be enjoyed by all and the power of learning to sing is almost universal.

It is claimed for the Tonic Sol-fa notation of music, when taught according to its true principles, that in it we have a system which enables *any* teacher who gives instruction in the ordinary branches of education to teach his or her pupils to sing correctly, intelligently and tastefully *from note.* These principles and the notation associated with them present so few difficulties, that when this system is used the pupils may find intelligent pleasure in their earliest music lessons, and even get some grasp of that intricate department of music—Harmony, the elements of which are brought before the pupil in the first lessons. The notation is so simple that the time, at the disposal of the teacher, allows him more fully to attend to those points which increase the interest of the pupils, improve the quality of the singing and have a greater refining influence; and this branch, when so taught, has a much higher educational value.

That the music lessons may profit more *physically,* the teacher must attend particularly to the position and breathing of the pupils. Let me give a few hints on these points:

Position. The *best* posture for singing is standing, but the pupils should not be tired by standing too long, for one of the uses of music in the class room is to give rest after the fatigue of heavier work and to renew the energies for lessons to follow. Draw up the pupils in single lines, in stand-at-ease position, resting more of the weight of the body on the left foot to steady the beating of the heart (which is often disturbed by first efforts at singing), the head erect but not thrown back, the shoulders back (but not up) to allow free use of the lungs. The pupils should breathe with the whole of the lungs, the top, the sides, and the lower part. The lungs or bellows should be well filled, and all filled to work with the best results the little musical instrument in the throat called the larynx.

Frequently give the class breathing exercises, thus, let the class with closed mouth take in a full breath while the teacher counts 1, 2, 3 slowly, then let out the breath while he lowers his hand counting 1, 2, 3, 4, etc, slowly. Be satisfied with little in the first lesson, but look for progress at every lesson till all the pupils can keep breathing out for 20, 30, 40 seconds or even longer, according to age and the strength of the pupils' lungs. Let the teacher see that each pupil in taking in a breath swells out the body at the chest, the ribs and also the abdomen.

This exercise is of very great importance and should be often repeated and in every class.

While the class is still standing let the teacher sing a clear musical note of medium pitch to any syllable, once or twice asking the class to listen carefully and then give the same sound. Many will give it correctly. Let the teacher, passing along in front, encourage these, and deal individually with the others, trying to get them to copy the sound. Wherever there is much difficulty, place the pupil beside a pupil who sings well and ask him to listen *only*, until the teacher has tried him again and finds that he sings in tune. It must be clearly understood that the pupil is not being punished. Mr. Curwen said that those who listened well would come to sing well.

Let the teacher change the pitch of the sound up and down until the majority of the class can readily reproduce any sound well within the compass of the voice—for the voice must never be strained, more particularly soft, young voices.

Next, let the teacher give a low sound, about C, and give the upper octave following it. This is the sound that blends best with the other sound, and when these two are sounded many at first do not recognize two sounds. Tell the pupils that in many respects it is the same note. Next, let the teacher give a low sound about C, and then the fifth note of the scale and try to get the pupils to reproduce these two notes. Then ask them to sing either, using any arbitrary sign to indicate which is wanted, singing them to the syllable *la*.

Next, let the teacher sing two or three notes to *la* and ask the pupils to tell which is the first and then which is the fifth. The name we give to the first is DOH, to the other is SOH. Write them on the blackboard thus:

SOH

DOH

Develop the mental effects of those notes to the fact that DOH in the first note of the scale, is the strong, firm, bold note, the fifth is the bright, grand, clear bugle note. The pupils' ideas will be more impressive than the teacher's. Give the manual signs: DOH the hand closed knuckles down; SOH the hand opened on its side, little finger downward. Get the pupils to sing these two notes from the manual signs or pointing on the board. Next, get them to sing them to *la*.

Next, tell the pupils to listen for a new note and introduce the third note singing to *la*. Ask the mental effect or character of this new note, the calm, quiet, peaceful, soothing ME which the pupils feel comes between DOH and SOH. Give the manual sign for this soothing ME, the hand open, palm downwards ready to stroke a child or an animal.

SOH
ME
DOH

Next, ask the children after hearing the pattern to sing DOH, SOH, ME. At first do not give the children the new note ME to sing ascending, only descending from SOH. Give the written signs for these notes, the initial letter d for DOH, m for ME, s for SOH, and d' for octave of d. Give such exercises as the following on the modulator from the manual signs, then on the blackboard first to the note names and then to the syllable *la*. Frequently change the pitch but keep each exercise within the range of young voices.

1. d d s s m d s s d.
2. d s m d d s m s d.
3. s m d s m d s s d.
4. s d' s m d s m s d'.
5. d' s m d d' s m d.
6. d s m m d m s d'.
7. d d m m s s d' d'.
8. s m d s d m d s.

This is the first step. The pupils have learned the principal notes, the pillars of the scale, and in them the notes of the most important chord—the D chord. When three or more notes that blend well are sounded together we have a chord. When these facts are brought before them the pupils have got their first lesson in harmony. If they can *hear* two or three of these notes together it will help and interest the pupils. Do not attempt to teach the other notes of the scale.

DOH'

SOH

ME

DOH

S.

J. A.

Musquodoboit Harbor,

NOTE.—Apparatus required—teacher's voice, blackboard and chalk. Mr. A. can post calico modulator or teaching chart for seven three cent stamps. Smaller size, three feet long, on paper for three three cent stamps.

NATURAL HISTORY OF ATLANTIC PROVINCES

(Concluded).

List of Works Bearing Specially on the Natural History of Nova Scotia.

MAMMALIA.

On the Mammalia of Nova Scotia. J. B. Gilpin in Proc. Inst. of Nat. Sci., N. S., in parts from 1865 to 1871. (Some parts out of print).

Papers in the proceedings of the same Society by Morrow, Gilpin, Hardy, etc., on the "Caribou," "Walrus," "Beaver," "Orthagorisca mola," etc.

The Mammals of Nova Scotia, a synopsis. By A. H. MacKay, in The Academy. Vol. I., Nos. 2, 3, 4 and 6, 1885 (out of print).

AVES.

In the Proceedings of the Inst. of Nat. Sci., N. S, are the following papers:

On the Land Birds of N. S., by Downs. Vol. I., Part 3, pp. 38-51, Vol. I., Part 4, pp. 130-136 (1864-5).

Observations on Sea Birds, by Ambrose. Vol. I., Part 3, pp 51-59 (1864).

On Some of the Razor Birds of N. S., by Jones. Vol. II., Part 2, pp. 70–74 (1867).

On the Eagles of N. S. J. B. Gilpin. Vol. III., Part 3, pp. 202-208 (1872).

Golden Eyes or Garrots in N. S. Gilpin. Vol. IV. Part 4, pp. 390–403 (1877).

On the Semi-annual Migration of Sea-Fowl, by Gilpin. Vol. V., Part 2, pp. 138–158 (1879).

Ornithological Notes, by Downs. Vol. VI., Part 4, pp. 326–328 (1885).

On the Birds of Prey of N. S. Gilpin. Vol. V., Part 3, pp. 255–269 (1880).

Birds of Nova Scotia, Downs and Piers. Vol. VII. Part 2, pp. 377–385, (1887). (This is the best list. A. H. MacKay).

The Birds of Pictou, A. H. MacKay, in Academy. Vol. I., No. 6—a list, (1885).

Amphibia.

Amphibia of Nova Scotia, by Educational Review. Vol. I., pp. 233–234. (MacKay).

Reptilia.

Reptilia of N. S. Jones. Proc. Inst. Nat. Sci., N. S. Vol. I., Part 3, pp. 114–128, (1864).

Pisces.

Synopsis of the Fishes of the Gulf of St. Lawrence and the Bay of Fundy, by Theodore Gill, in "Canadian Naturalist." Vol. II., (new series), paper 16, (1865).

Proc. Inst. Nat. Sci., N. S., the following papers:

On the Gaspereaux of N. S. Gilpin. Vol. I., Part ——, pp. 114–128, (1861).

On the Food Fishes of N. S. Gilpin. Vol. I., Part 4, pp. 11–18 and 76–91; Vol. II., Part 1, pp. 104–112; Vol. II., Part 2, pp. 17–26.

Fish of St. Margaret's Bay. Ambrose. Vol. I., Part 4, pp. 33–43; Vol. II., Part 1, pp. 67–76; Vol. II., Part 2, pp. 87–91.

On the Salmon of N. S. E. Gilpin. Vol. V., Part 1, (1878).

Nat. Hist. and the Fisheries, A. P. Reid. Vol. I., Part 2, pp. 131–137.

List of the Fishes of N. S. Jones. Vol. V., Part 1 (1879).

Insecta.

Nova Scotian Lepidoptera, Jones. Proc. Inst. Nat. Sci., N. S. Vol. II., Part 4, pp. 78–88 (1868).

Nova Scotian Coleoptera. Jones. Proc. Inst. Nat. Sci., N. S. Vol. II., Part 3, pp. 141–155 (1868).

N. S. Diurnal Lepidoptera. Jones. Proc. Inst. Nat. Sci., N. S. Vol. III., Part 1, pp. 18–27 (1870), and Vol. III., Part 2, pp. 100–103 (1871).

List of Nova Scotian Butterflies. Silver. Proc. Inst. Nat. Sci., N. S. Vol. VII., Part 2, pp. 86–89.

Object Lessons on N. S. Insects, Educational Review. Vol. I. and II.

Mollusca.

Mollusca of Nova Scotia. Jones. Proc. Inst. of Nat. Sci., N. S. Vol. VI., Part 3 (1887).

Teredo Navalis in N. S. Murphy. Proc. Inst. Nat. Sci. N. S., Vol. V., pt. 4 (1881).

On the Marine Mollusca of Eastern Canada, Whiteaves. Canadian Naturalist. Vol. IV. (new series), Art 6.

Protosoa.

On N. S. Fresh Water Sponges, MacKay. Proc. Inst. Nat. Sci., N. S., (1884).

Nova Scotian Fresh Water Sponges, a synopsis, MacKay. Proc. Inst. Nat. Sci., N. S., (1885).

New Fresh Water Sponges From N. S. and Newfoundland, MacKay. *Canadian Record of Science.* Vol. II., pp. 19–22, (1886).

Fresh Water Sponges of Canada and Newfoundland. A synopsis of what is known at present of them, 1889. Trans. Royal Society of Canada, 1889.

Botany.

Diatomaceæ of Nova Scotia. Notes with a list of recent and fossil. A. H. MacKay. *Canada Record of Science.* Vol. I., No. 4, pp. 236–244 (1885).

Algæ of Nova Scotia and New Brunswick. Hay and MacKay. Trans. Royal Society of Canada. Sec IV., 1887. Pp. 167–174.

Lichens of Nova Scotia. MacKay. Proc. Institute of Natural Science, N. S. Vol. V., part 3, pp. 299–307 (1880).

Mosses of N. S. Mackay, in Lindsay's Catalogue. Proc. Institute of Natural Science, N. S. Vol IV., part 2, pp. 184–223 (1875).

Mosses of Nova Scotia. Dr. Somers. Proc. Institute of Natural Science, N. S. Vol. IV., part 4, pp. 362–369; and Vol. V., part 3, pp. 268–271 (1887–'89).

Fungi of N. S. Somers. Proc. Institute of Natural Science, N. S. Vol. V., part 2, pp. 188–192; and Vol. V., pp. 247–253; and Vol. V., part 4 ; and Vol. VI., part 4

Nova Scotia Ferns. Ball. Proc. Institute of Natural Science, N. S. Vol. IV., part 2, pp. 146–157 (1875); and Vol V., part 1, pp (1878).

Recent Additions to Canadian Filicineæ, etc. Burgess. Trans. Royal Society of Canada. Sec. IV. (1886), pp. 9–18.

Canadian Filicineæ Macoun and Burgess. Trans. Royal Society of Canada. Sec. IV. (1884), pp. 163–226.

Catalogue of Nova Scotian Plants. Lindsay. Proc. Institute of Natural Science, N. S. Vol. IV., part 2, pp. 184–223 (1875).

In Proc. Institute of Natural Science, N. S., the following papers among others:

Lawson. "Ericaceæ of Canada." Vol. III., part. 1, pp. 362–369 (1878).

How. "Flora of Nova Scotia." Vol. IV., part 3; Vol. III., part 2, pp. 174–176.

Lawson. "Canadian Species of Rubi." Vol. III., part 4, pp. 364–367 (1873).

Hardy. "Nova Scotian Conifers." Vol. I., part 4, pp. 120–130.

Lawson. "Notes on N. S. Plants." Vol. IV., part 2, pp. 167–179. "Notes on Rare Plants." Vol. VI., part 1.

Somers. "Notes on Compositæ." Vol IV., part 3 (1876). "Flora of N. S. and Colorado." Vol. IV., part 2, pp. 122–131.

Revision of Canadian Ronunculaceæ. Lawson. Trans. Roy. Soc. of Canada. Sec. IV. (1884), pp. 15–90.

Catalogue of Canadian Plants. Macoun. Geology and Natural History Society of Canada. Parts I., II., III. and IV. (from 1883 to present date).

GEOLOGY.

Dawson's Works and Monographs, in publications of Geology and Natural History Society, of Canada, and in numerous other societies. *Honeyman*, in Proceedings of Institute of Natural Science of Nova Scotia, which contains articles on mineralogy. Also, Patterson, in Archæology.

There are numerous references and even many papers on Nova Scotian Natural History (particular sections) in such publications as the "Annal and Mogasim of Natural History Society," London; "Proceedings of the Academy of Natural Sciences," Philadelphia; "Naturaliste Canadien," "Canadian Entomologist," "Canadian Naturalist," "Smithsonian Publications," etc., etc.,

Some of the New Brunswick lists, given by Mr. Ganong, will also apply to Nova Scotia as well. I feel that I have not given nearly so complete a list as I could; but in some respects it is unnecessarily extensive for the purposes of the student. I have not referred to popular papers in "Acadian Scientist," etc., etc.,

List of works treating specially of the Natural History of New Brunswick:

The *Mammals* of New Brunswick (an annotated list). By M. Chamberlain. Bull. N. B. Nat. Hist. Soc. No. III., 1884, 37–41. (Also lists by Hinds in "Rep. on Geology of N. B." Gesner, "New Brunswick." Adams, "Field and Forest Rambles," etc.

A catalogue of the *Birds* of New Brunswick. By M. Chamberlain. Bull. N. B. Nat. Hist. Soc. No. I., 1882, 23–68. (Also lists by Gesner, Adams and others, and several lists of special regions by Boardman, Henick and others).

List of *Reptiles* and *Amphibia.* By A. L. Adams, in "Field and Forest Rambles." Gesner, "New Brunswick."

Annoted Lists of the Fishes of New Brunswick.

A. Gesner in "New Brunswick." M. H. Perley, "Descriptive Catalogue (in part) of the Fishes of New Brunswick and Nova Scotia." Gov't. Report, Fredericton, 1852.

INSECTA.—No list.

CRUSTACEA.

Stimpson's Synopsis of the Marine Invertebrata of Grand Manan gives a good list for southern coast.

MOLLUSCA.

"Marine Mollusca of New Brunswick." By W. F. Ganong. Bull. N. B. Nat. Hist. Soc., No. VI., 1887, 17–61.

ECHINODERMATA.

"The Echinodermata of New Brunswick." By W. F. Ganong. Bull. N.B. Nat. Hist. Soc., No. VII. 12–68.

Stimpson's "Synopsis of the Marine Invertebrata of Grand Manan." (Smithsonian contributions, Vol. VI., 1884), gives annoted lists of all groups of invertebrates except protozoa and sponges.

IN BOTANY.

A Preliminary Catalogue of the Plants of New Brunswick. By Rev. Jas. Fowler. Bull. N. B. Nat. Hist. Soc. No. IV., 1885, pp. 8–84, with additions in succeeding numbers. A privately printed list was issued by the same author some years ago.

IN GEOLOGY.

Many papers by Matthew, Bailey and others in various journals and reports.

IN ARCHÆOLOGY.

Papers by Bailey and Matthew in the Bulletins of the N. B. Nat. Hist. Soc.

A FUNGUS INSECT-DESTROYER.—Prof. Arthur, botanist at the New York Experiment Station, discovered, last summer, a fungus that grows upon the Clover-leaf weevil and destroys it in a few hours. It propagates itself rapidly, and there is a prospect that it may be the means of holding in check or exterminating this insect enemy of the clover plant.

PERSONAL NOTES.

There are three vacancies in the staff of the Pictou Academy, caused by the resignation of Principal MacKay, Science Master, to take the Principalship of the Halifax Academy: of Jas. C. Shaw, Classical Master, to take a "Munro" tutorship in Dalhousie College; and of R M. Langill, Mathematical Master, to enter on the practice of law.

Rev. Dean Gilpin, D. D., Principal of the Halifax Academy, has intimated his resignation at the end of this term, after a singularly long and successful career of forty years in the teaching profession. In this long and busy life he put an impress upon thousands of the ablest minds in our country; and long after he rests from his labors the influence of his genial and literary spirit will be widening its ever progressive sphere. In him the profession have a model of modest, patient and scholarly effort, and the public a a man whom they should delight to honor.

D. A. Murray, B. A., (Dalhousie), Truro, N. S., has been awarded the mathematical fellowship of the Johns Hopkins University. It is of the annual value of $500 for two years.

Gordon Laird, B. A., (Dalhousie, 1889), P. E I., has just been awarded a fellowship at Cornell University in classics.

SCHOOL AND COLLEGE.

ACADIA COLLEGE.—The following were graduated at Acadia College at the closing exercises in June:

Henry T. DeWolfe, St Stephen, N. B.; Edward M. Bill, Billtown, N. S.; Hugh S. Blackadar, Halifax, N. S.; O. O. Lyons, Waterville, N. S.; Judson Kempton, Hopewell, N. B.; Walter S. Black, Salem, N. S.; Archibald W. Foster, Bridgetown, N. S; Leander A. Palmer, Dorchester, N. B.; J. Howe Cox, Cambridge, N. S.; Wilfred B. Crawley, Sydney, C. B.; Fred C. Hartley, Carleton, N. B.; Mockett C. Higgins, Wolfville, N. S; Charles S. Lyons, Somerset, N. S.; Horace W. McKenna, Kingston, N. S; Charles H. McIntyre, Springfield, N. B.; Wellington H. Jenkins, Cody's, Queens, N. B.

The members of the class were presented for their degrees in the usual formal manner, by Rev. W. H. Warren, M. A., and received their parchments at the hands of the President.

The degree of M A in course was conferred upon Rev. O C S. Wallace, and Mr. A K DeBlois, who had received the degree of M. A in course from Brown University, was admitted *ad eundem gradum*. Two honorary degrees were conferred, that of Doctor of Science on Prof. Wm. Elder, of Colby University, and that of Doctor of Divinity on Rev. Calvin Goodspeed, of the *Messenger and Visitor*, St. John.

The following are officers of the Alumni of Acadia for 1889-90:

President, F. H. Eaton, M A.; Vice-president, I. B. Oakes, M. A.; Secretary-Treasurer, S. W. Cummings, B. A.; Directors, Rev. A. Foshay, Windsor; H. L Beckwith, B A., Halifax; Rev. S. A. Ford, B. A, Fairville, N B.; E. D Webber, B A., Truro; H. A. Lovett, B. A., Halifax; L. S Payzant, Halifax; F. Rand, Kentville.

QUESTION DEPARTMENT.

Questions and Answers.

F. M. E.—Will you kindly tell me the best and most practical way of preserving the *larvæ* of insects?

Put them for a few days into a bottle of whiskey or alcohol diluted to half strength. Then transfer them to small glass vials about their own size, filled with strong alcohol and secured with tight corks. The dilute alcohol is to prevent too much shrinkage by the abstraction of water before the tissues become hardened. The small vial is to enable the larvæ to be easily examined from every point of view.

To preserve the color of the larvæ some recommend dipping the caterpillar for half a minute into boiling water before transferring to the alcohol.

A method requiring more patience and skill is to eviscerate the larvæ, then inflate its skin by means of a blowpipe, made of a glass tube drawn into a fine point, in a current of dry heated air until the skin dries and hardens into shape. The heated air may be obtained within a sheet iron funnel or tube heated from without by the flame of a spirit lamp.

R. M, PICTOU CO.—Enclosed I send you a number of apple twigs with their extremities swollen and the terminal bud seed, so that extensions of the twig can only occur by side shoots from the sides or bores of the swollen part. What is the cause? Is it injurious? And how may it be prevented? Three or four of my young trees are partially affected; and I am informed that several neighboring orchards are similarly affected.

1. It looks like the work of the Apple-bud worm (*Eccopsis malana*, Fernald). The mischief is done by the larvæ which eats the terminal bud in early summer and even burrows into the end of the twig. It is a pale yellowish green caterpillar, sometimes tinged with pink on its back, according to Saunders. Generally, after devouring the bud, it fastens a neighboring leaf down to the twig as a temporary domicile, which it finally deserts to form a yellow woolly tubular cocoon. It now becomes of a dark

flesh color with small bright spots, totally black head and black shield on the next segment. It is now half an inch long, shuts itself up in its cocoon and in a week or ten days emerges as a moth with white fore wings mottled greenish brown. There is a large grayish brown spot at the tips spotted with white, and another spot of darker shade towards the base of the wing. The hind wings are dusky. The egg is next deposited and remains until it is hatched with the bursting bud.

2. It is injurious to the trees, deforming the branches and retarding their growth. Saunders states that recently it seriously injured the orchards of Northern Illinois; but it has not to our knowledge been complained of in Canada.

3. Hand-pick them whenever any leaves are seen fastened down to the twig—or when the cocoon is being formed and before the pupa stage is past. When the moth appears it is too late. If numerous, a spray of Paris green or London paris is recommended—nearly a teaspoonful of the poison to the gallon of water. A small ichneumon fly has been found to be parasitic upon the larvæ, which cause them to die before the pupa stage is reached. Neither the bud-worm nor the ichneumon has yet been observed here. We give this outline description of *Eccopsis malana* to assist those interested in observing. The state of the twigs appears to plainly indicate the author of the mischief.

H. M. K.—Are carp really cultivated in Nova Scotia, by a Mr. Thomas MacDonald, at Durham, as one would infer from your May "Ferndale" article; and if so, has he been successful?

1. They are cultivated as intimated in the said article.

2. Mr. MacDonald answers the second question substantially, as follows:

In the fall of 1884, I received nineteen German Carp from Mr. Baird, Commissioner of Fisheries, at Washington. The largest of the number were about five inches in length, while the smallest were about two and a half inches. They were quite lively after their long journey. Their travelling house was a tin can, holding about one and a half gallons of water if full. But it was only half full on arrival. I gave them some small crumbs of bread which they soon devoured. I then placed them in the pond which I had prepared for them. This was late in November. In the summer of 1886 they had grown to over one foot in length. In the fall of that year I constructed two other ponds. The larger is about two acres in extent, while the deepest place in either pond is four feet.

I sorted the young fish from out of the pond in which the nineteen carp were originally placed after they had been there two seasons. This sorting gave me 2,500 small ones which I placed in the two new ponds. There was quite a number left in the first pond. My calculations, respecting the effects of freshets, however, were not correct, for the new ponds; and, as a consequence, I lost a good many of them during the following winter. But in the winter of 1888 I was more successful, so that now I have tens of thousands of fish in my ponds. There is certainly no fish whose spawning can be controlled which propagate so readily. And from my experience with them, I have no doubt that the raising of them can be made a grand success all over the dominion. They do not eat their young as many fish do. They will live on anything pigs will eat, in addition to the water grasses and weeds which should be kept growing in their wide, warm and shallow ponds.

Their flesh is as delicious for the table as good trout or salmon.

One season they were so domesticated that on several occasions they ate out of our hands. They are in every way extremely interesting and form quite an attraction on the farm.

EDUCATIONAL OPINION.

Inspectors all over the province have repeatedly urged the wisdom of adopting the "*one term* system." Students who attend college for one-half the year naturally favor a continuance of the existing *regime*. The law, however, is not supposed to consult the convenience of a class who confessedly make teaching a stepping-stone to professions which are conceived to be of a higher order. And as college faculties everywhere appear to favor an extension of their terminal sessions, students, if so disposed, could teach one year and attend college the next. This measure is entitled to thoughtful consideration.—*Inspector Gunn* (*N. S.*)

The course of study has been adopted with satisfactory results in most of the schools in the district. With few exceptions teachers are unanimous in their approval of its provisions. The failures which occur in its successful adoption are invariably made by those who could not successfully carry out any course of study. Of course due allowance must be made for irregularity in attendance and other causes which hinder the successful operation of any programme in the schoolroom.—*Inspector Morse* (*N. S.*)

Sixty-seven of the Cumberland teachers have been engaged in the profession over three years, and eighteen over seven years. Although poorly paid, our teachers make honest efforts to improve themselves for their position. Their attendance at associations and institutes, and their subscriptions to educational journals, prove this, while I can testify to the good results visible in my half-yearly visits to their schools. I may mention that at least 180 of my teachers are subscribers to the EDUCATIONAL REVIEW.—*Inspector Lay* (*N. S.*)

Trustees are also discharging their duties more intelligently. In answer to the question which has often been put to me by trustees, "What can we do? What do we know about a school?" I have answered: You can insist upon the room being always kept clean and in good order and look after the repairs of accidental injuries. You can see that books, maps and the register are kept in good condition and supply what is needed, and above all, you may take it for granted, that where there is imperfect control, but little instruction can be imparted, and no good moral influence exercised.—*Inspector Condon* (*N. S.*)

* * All schools should be required to give positive instruction in the elements of music. No more time is needed than is now used, but the time must be spent in a different way. It seems to me that the times demand this kind of teaching at our hands. The more favored receive some vocal instruction from private teachers; but the masses cannot afford the expense of this kind of instruction, and therefore receive little or no knowledge in the theory of music. The teachers of the public school can enhance the value of their work very much by giving a good drill in reading music.—*Inspector Roscoe* (*N. S.*)

Considerable fluctuation is shown in the average salaries paid the different sexes and grades, but on the whole there was a slight increase. A curious and not at all gratifying fact is that in Pictou county, the increase was made in the salaries of the lower grades and the decrease in the higher. In this connection I would remark that it is not creditable either to the intelligence or sense of justice in the towns of Pictou, New Glasgow and Truro, that the sums paid the Grade B female teachers are less than those paid the Grade C employed in the corresponding departments of those schools. In no instance does the Grade B receive as much as the Grade C, and in one case in each the amount is less by $30.00, or exactly the amount of additional grant of Grade B. It might be argued in favor of giving *equal* salaries to both grades, that the qualifications of Grade C are sufficient for the situation, but to lessen the payment of Grade B is certainly grossly unfair, and simply amounts to the appropriation by the section of a grant made by the government to the teachers for superior attainments. I trust that this injustice requires only to be pointed out to be remedied, and that any discrimination made hereafter may be in favor of, and not against, teachers of higher grades.—*Inspector McLellan* (*N. S.*)

The Provincial Normal School, of Nova Scotia, has, since its organization over thirty years ago, devoted a large proportion of its time and energy to academic work. In this regard it has not differed materially from most similar institutions in Canada and the United States. Indeed, in almost all countries in which such institutions exist, the work has been of a mixed character,—partly academic and partly professional. The proportion of the two kinds of work, as well as the more or less elementary character of the institutions given in different normal schools, has been governed by the educational condition of the country in which such institution existed. While such a combination of elements was, perhaps, a necessary condition of the existence of the normal school of Nova Scotia at the time of its organization, and for many subsequent years, the conviction is strong in my mind, that the changed circumstances of the present day render the prosecution of academic work, simply as academic work, not only unnecessary, but a wasteful expenditure of energy, and a barrier in the way of progress and the complete fulfilment of the legitimate function of such an institution. The ideal normal school, and that for which the country is now ready, is a more thoroughly technical school, whose true function is to make teachers rather than scholars. The academic and high schools of the province, now so numerous and efficient, on their part should be restricted to the advancement of general scholarship.—*Principal Calkin.*

The Agadic Method.

Pursuing the subject of a note in the *Critic* of 10th inst., we quote the following passage from the EDUCATIONAL REVIEW: "But these simple minded men (the early Christians) could more easily see a great mystery in the remarkable lettering of the word fish, taken from the Greek Testament, than in abstruse astronomical knowledge, so generally unknown even to the comfortable Christian of to-day, who can get it, much of it, even in a free advertising almanac. The Greek for fish is *Ichthus*. There were here, in order, the initials of the name above all names—the name of Him for whom they lived, the name of Him for whom they died, Jesos Christos, Theou Uios, Soter, 'Jesus Christ the Son of God the Saviour.'

The fish, *Ichthus*, was therefore the emblem, the symbol of the great name of its attributes, which should not be even lightly spoken." This is, no doubt, true, as well as the zodiacal influence. Peculiar stress was laid by the Jews on coincidences in words, syllables and letters, which they carried to an extreme of superstition. It developed into what is called the "Agadic" method, and the word "*ichthus*" is one of its most remarkable, and at the same time, one of its fairest examples. In another note we give some explanations of this term, and at a future opportunity we will give another striking instance of the influence of the method which is, we believe, but little known to general readers.—*Halifax Critic*.

LITERARY NOTES.

D C. Heath & Co., will publish at once *The Laws of Health in Relation to School Life*. It is an admirable compend of sanitary science, indispensable to those who are erecting new school buildings or modifying those already existing.

THE HALIFAX "CARNIVAL ECHO."—The *Carnival Echo*, to be issued as a souvenir of the Halifax Summer Carnival, will be a triumph of modern art and journalism It will illustrate Halifax in a style that has never been attempted before, while its portrayal of the carnival will be unique and brilliant. The book is to be over fifty pages in size, with a cover of original and artistic design, beautifully executed in colors. The engravings will consist of carnival scenes, views of Halifax, its unrivalled public gardens, Point Pleasant park, and other surroundings, and portraits of prominent citizens. The reading matter, furnished by men of acknowledged literary talent, will describe the carnival and its various attractive features, besides special articles on other appropriate topics. The official carnival programme will be printed in it.

D. C Heath & Co., Boston, will soon issue *De Garmo's Essentials of Method*. The functions of the book is to discover, through an analysis of the mental activities involved in knowing what are the essential elements of good method in teaching. It is accompanied by practical illustrations, showing the application of the general laws of right method to all the branches of the common school curriculum

GINN & COMPANY will publish early in August, Dumas, "*Les Trois Mousquetaires*," edited by Prof. F. C. Sumichrast of Harvard, for use in schools and colleges. Prof. Sumichrast, a few years ago the very efficient registrar of the University of Halifax, is well and favorably known in the Atlantic provinces of Canada.

D. C. HEATH & CO., will publish July 20th, *An Introduction to the Study of Shakespeare* by Hiram Corson, Prof of English Literature, Cornell University. It will be an attempt to indicate to the student some lines of Shakesperian study which may serve to introduce him to the study of the Plays as plays. The commentaries presented on Romeo and Juliet, King John, Much Ado about Nothing, Hamlet, Macbeth, and Anthony and Cleopatra, aim chiefly to present the points of view which are demanded for a proper appreciation of Shakespeare's general attitude toward things, and his resultant dramatic art.

A *School Iliad with Vocabulary*, edited for schools by Prof. T. D. Seymour, of Yale College, will be published shortly by Ginn & Co., Boston. The introduction presents, in brief, but systematic form, the most important facts regarding Homeric life, the Homeric poems, Homeric style, syntax, dialect and verse The commentary is adapted to the wants of beginners in Homer. The notes are copious for the first three books. They are less copious for Books IV.–VI., but the commentary on Book VI. is fuller than that on Books IV., V. The vocabulary is illustrated with more than twenty wood-cuts, most of which is new in this country.

D C. Heath & Co., Boston, have become the American publishers of the *Isaac Pitman's Shorthand Books*. The system is founded on strictly phonetic principles, it is adapted to reporting, to letter-writing, and to general business purposes. It can be learned in six months with only five hours per day practice It combines the legibility of longhand with the brevity of shorthand.

BOOK REVIEWS.

EAR AND VOICE TRAINING BY MEANS OF ELEMENTARY SOUNDS OF LANGUAGE. By N. A. Calkins. New York and Chicago: E. L. Kellogg & Co. 50 cents. It is so simple that the youngest teacher can at once apply every sentence, and yet it is so thorough that the college professor of rhetoic could with benefit make it a pocket companion. Among the subjects discussed are Speech Training, Comparing the Sounds of the Letters, Vowel Sounds Grouped, Breath and Voice Sounds Grouped, Suggestions for Removing Difficulties of Utterance and Impediments of Speech.

ALGEBRAIC ANALYSIS, Part I. Introduction price $1.50. Publishers, Ginn & Co., Boston This work is intended to supply students of mathematics with a great variety of solved examples and unsolved exercises in the application of the fundamental theorems and processes of pure algebra and to exhibit to them the highest and most important results of modern algebraic analysis. It is the work of three practical mathematicians, G A Wentworth, A. M , J. A. McLellan, LL D., Inspector of Normal Schools, Ontario, and J. C Glashan, Inspector of Schools for Ottawa. It is a revised edition of Wentworth and McLellan's University Algebra, and cannot fail to prove of great value to students.

EDUCATIONAL AND INDUSTRIAL DRAWING; MANUAL TRAINING; Nos. I and II. Largen S. Thompson. Publishers, D. C Heath & Co., Boston, Chicago and New York. These Manual Training Books, Nos. I. and II., attempt to bridge the gap between the kindergarten and the laboratory and technical school by methods at once educational and practical. The key-note is struck in the following: "The whole universe exists for each child. Each child has space and time relations to this universe, and the universe has the same to the child. If he would be master of himself he must learn these relations." Teachers who are convinced that "Manual Training" is a necessity, but who do not know "*how to begin*," will find these books, which are not at all expensive, a safe and easy guide. The introduction is full of suggestion and does not promise more than the book makes good. The handling of models by the children themselves is insisted on, and making is carried on with a great variety of inexpensive material. No. II., in addition to color, folding, pasting and drawing, proceeds to mechanical drawing, clay-modelling and wood-carving. A careful study of this work will convince our earnest teachers that manual training is not of necessity, cumbrous or expensive, or beyond their ability. We commend it heartily as a valuable contribution to the cause of education and as meeting the requirements of those who demand more practical results from our common school work.

A set of drawing books accompany this course, but these two numbers may be used independently and will be found to cover special ground. We shall call attention to following numbers as they appear.

HAND-BOOK OF MUSIC LESSONS, by W. S Tilden. Publishers, Ginn & Co., Boston. This is a cheap and excellent little work of patterns and directions for teaching pupils of the first year grade. It consists of thirty-eight consecutive steps, the purpose of which is to train the voice and introduce the pupil to a few of the most common musical characters.

CHILDHOOD'S POETRY AND STUDIES IN LIFE, FORM AND COLORS OF NATURE. Emma Marwedel, D. C. Heath & Co., Boston. This book with its charts of form and color, has been favorably endorsed by the "N. A. Frœbel Institute," and is an apt illustration of the ability of Frœbel's disciples to work out germinal truths, left undeveloped but distinctly suggested, to logical results Any one who will study the 42 pages will find them full of interest and very helpful in teaching color and the drawing of circular forms. Chart III. in four divisions present shades of colors, analysis of colors, blending of colors and complementary colors. We should like to see this artistic presentation of color not only in the kindergarten but in the nursery and schoolroom "Sensibility to color is a fair test of art-intellect," says Ruskin, and "the man who can see all the greys and reds and purples in a peach, will paint the peach rightly round and rightly altogether.

NOS ENFANTS ET LEURS AMIS; with notes, vocabulary and exercises. published by MacMillan & Co., London and New York. This is one of a primary series of French and German readers, edited by Eugene Fasnacht. There are seven short and interesting stories in this volume, with notes and vocabulary for the translator.

THE EXPERIMENTAL FARMS OF CANADA, being an appendix to the report of the Minister of Agriculture for 1888. This blue book is one of special interest to all interested in the development of agriculture in its widest sense. We have here combined the reports of the Director. Professor Saunders; of the Chemist, Mr. Shutt; of the Entomologist and Botanist, Mr. James Fletcher; of the Horticulturist, Mr. Hilborn; of the Poultry Manager, Mr. Gilbert; of the Experimental Farms of Nova Scotia, by Mr. Blair; of the North West Territories at Indian Hood, by Mr. MacKay; of Manitoba, at Brandon, by Mr. Bedford. The reports of the Director and the Entomologist will be specially interesting to the scientist as well as to the agriculturist.

GUIDES FOR SCIENCE TEACHING, NO XV.; published by D. C. Heath & Co, Boston. This number, containing thirty-six Observation Lessons on Common Minerals, by Henry L. Clapp, of Boston, is admirably adapted for those who would teach successfully the subject of Common Minerals. They are practical, and any teacher who studies this book carefully should arouse a deep interest in classes on this subject.

PUBLICATIONS RECEIVED.

The *Popular Science Monthly* for July contains replies to Huxley, by Rev. Dr. Henry Wace and the Bishop of Peterborough, an illustrated article on Microscopic Fungi, by Prof. McBride. But we cannot specify excellence where all is so good....The *Forum* for July treats of the "Scholar in American Life," by Bishop Potter. "Anti-Darwinian Fallacies," by Romaines. "The Attitude of the French Canadians," by Beaugrand. "Date Theories Concerning Fever," by Dr. Flint. "Organizations of the Discontented," by Hinton. "Domestic Service," by Jennie C. Croly. "The Better Side of Anglo-mania," by Rev. H. Pierce ... The *American Naturalist* for February has the usual staple scientific articles, with a remarkably full assortment of notes in the various departments of natural history....*Wide Awake* for July is true to its name. It will keep the old as well as the young quite wide awake until it is all "gone through."....*St. Nicholas* for July is good. Among the many the note "How a Battle is Sketched," by Theodore Davis. "Among the Florida Keys," by Holder. "A Narrow Escape," by Planz, etc., etc....The *Microscope* is well filled with general articles and news of microscopic interest--just what the microscopist needs....*Garden and Forest* is as new and as fresh from issue to issue as the landscape of a travelling botanist....The *Scientific American* has no superior in successfully popularizing things scientific. *Le Francais*, a monthly review of French, grammar and literature, is published at 21 University Place, New York. It is now in its ninth year, and costs only $2.00 per annum. ....The *Building News*, published in New York. No. 2 Spruce Street. at $1.00 per year, is now in its fourth year. ....The *Century* of June has a description of the "Convict Mines of Kora," by Kennan. "The Bloodhound," "Early Heroes of Ireland," "Italian Old Masters," "Bird Music," "The Relations of the United States and Canada," "Can the Emperor Forget," "An American Amateur Astronomer," etc., etc., on its list of contents.....The *Teacher* (N. Y. City); .. The Manitoba *Colonist* (Winnipeg, J. A. Curman, publisher);....*Waterman's Journal*, Boston, Mass.);....The *Pennsylvania School*, (Williamsport, Pa).

PROVINCIAL EDUCATIONAL ASSOCIATION.

THE Tenth Annual Meeting of the Provincial Educational Association will be held in the Assembly Hall of the Normal School, Truro, on the 10th and 11th July, 1889.

PROGRAMME:

WEDNESDAY, JULY 10TH.

10 a. m.—12.30 p. m.

Enrolment of Members. Financial Statement

1. *Some Phases of Modern Educational Progress*, by DR. ALLISON, Superintendent of Education.
2. *Educational Obstructions*, by A. McN. PATTERSON, M. A., of Acadia Villa Seminary.
3. *The Course of Study*, by F. H. EATON, M. A., Prof. of Mathematics, Normal School.

2—5 p. m.

4. *Calisthenic Drill*, by SERGEANT-MAJOR BAILEY.
5. Discussion on *The Course of Study*
6. *Transfer Examinations*, by H. S. FREEMAN, B. A., of Amherst Academy, and A. CAMERON, ESQ., of Yarmouth Academy.

8—10 p. m.

7. Public Meeting. *Our Common Schools*, by Hon. D. C. FRASER, M. E. C.
8. An address by the Right Reverend the Lord Bishop of Nova Scotia.

THURSDAY, JULY 11TH.

9.30 a. m.—12.30 p. m.

I.—PRIMARY SECTION.

9a. *Kindergarten in the Primary School*, by W. R CAMPBELL, B. A., Truro Academy, and MRS S. PATTERSON, of Truro.

10a. *Arithmetic in the First and Second Grades*, by MISS N. E CHURCH, Normal School medalist.

II.—COMMON SCHOOL SECTION.

9b *Language in the Third to Sixth Grades*, by MISS N. A. BURGOYNE, Windsor

10b. *Duties of Principals*, by F. McKAY, B. A., New Glasgow High School.

III.—ACADEMIC SECTION.

9c. *Natural Science in the School*, by PROF. SMITH, Agricultural College, Truro.

10c. *Academic Diplomas*, by GEO MILLER, ESQ , Hantsport High School, and N. C. JAMES, B. A , Halifax Academy.

2.30 – 5 p. m.

11. Balloting for Officers.
12. *Music — Tonic sol-fa*, by REV. JAMES ANDERSON, M. A.
13. *Singing Class*, conducted by MISS W. G CROWELL, Model School.
14. *Civics*, by Prof. J. F TUFTS, M A.
15. Announcement of Officers. Miscellaneous Business

It will be noticed that the subjects selected are of particular interest at the present time, and that they are to be introduced by able and successful educationists. In addition to the special discussion on the course of study there will be opportunity given for a general discussion of all the other subjects. Members of the Association may expect the usual fee or reduced return tickets on the principal lines of travel.

A. McKAY,
Secretary.

Halifax, 10th June, 1889.

P. S.—I beg to call your attention to the above programme of the Teachers' Convention. A little preliminary reading and study of the subjects coming up for discussion will add very much to the profit and pleasure of the occasion.

Yours very truly,

A. M.

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GREEK SUBJECT:

Xenophon, *Anab.* Book IV.
Dalhousie for Munro Exhibitions and Bursaries will require also Xenophon *Anab.* Books V. and VI.

LATIN PROSE COMPOSITION:

Bradley's Arnold, Exercises 1-44.
Dalhousie for Munro Exhibitions and Bursaries will also require *Greek Prose Composition* as in Fletcher and Nicholson (A. Baillie, Kingston, Ont.) Exercises 1-28.

FOR 1891 (TO BE USED 1890-91).

LATIN SUBJECTS:

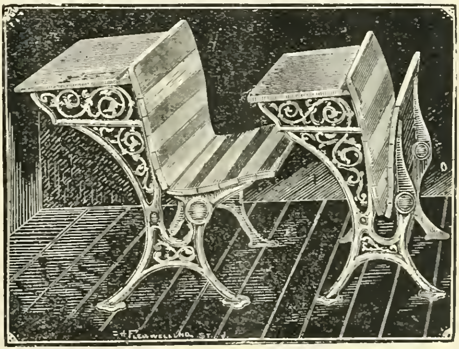
(1) Cæsar *de Bell. Gall.*, Books IV. and V.
(2) Virgil, *Æneid*. Books II.
For ordinary matriculation Dalhousie will accept either (1) or (2). In addition to (1) and (2) Acadia will require Cicero, *Pro Archia.*

GREEK SUBJECT:

Xen. *Anab.* Book V.
Dalhousie for Munro Exhibitions and Bursaries will require also Xen. *Anab.*, Books VI and VII.

LATIN COMPOSITION, &c.:

As for 1890.



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The Calendar for the Session of 1889 90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows.—

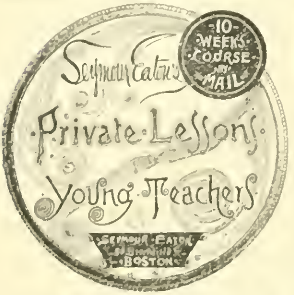
Faculty of Arts—(Opening Sept 16th. 1889).
Donalda Special Course for Women—(Sept. 16th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
Faculty of Medicine—(Oct. 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

(Address McGill College.)

J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.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DOUBLE NUMBER.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N.B., AUGUST AND SEPTEMBER, 1889. VOL. III. No. 3 AND 4

A. H. MacKAY, B. A., B. Sc.,
Editor for Nova Scotia.

ALEX. ANDERSON, LL.D.,
Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

OUR DOUBLE NUMBER.

We confess that this number of the REVIEW appears somewhat tardily. It is the first holiday that the REVIEW has taken, and we trust that our readers will be glad to welcome it after its brief rest. The present number, issued for August and September, consists of thirty-two pages, and furnishes an interesting page of our educational history for the past two months. *Four thousand* copies are sent to subscribers and those whom we hope to enrol in the near future on our books. These 4,000 copies will probably reach the eyes of over 20,000 readers—an evidence that the REVIEW, just entered on its third year, is a vigorous offshoot of our educational system.

That it is appreciated we have had abundant evidence. We hope that those who may read its pages for the first time will see in it a worthy exponent of Atlantic Province education and as such entitled to their support, Its excellence was warmly endorsed by hundreds of assembled teachers at our educational conventions and at the N. S. Science School. With such a strong public sentiment in its favor, backed up with an increasing material support, its editors feel that the aims they had in view are being accomplished: A greater *esprit de corps* among our teachers, a broader sympathy and co-operation among all classes of educational workers, the erasing of provincial and sectional prejudices, with the advocacy of scientific and rational methods in teaching. The success of the REVIEW is an evidence that this work is being accomplished, and with scores of vigorous and sympathizing assistants, its editors feel that what they have done is "but earnest of the things that they shall do."

EDITORIAL NOTES.

SOME valuable contributed and other articles are unavoidably held over until our next number, which will be published early in October.

THE occultation of Jupiter by the moon on the 3rd was not visible at Pictou on account of a dense smoke-like haze which prevailed for a few days. In St. John the same cause, but to a less extent, prevented a clear view of the interesting phenomenon. Our readers should be on the look out for the conjunction of planets referred to in another column.

THE annual meeting of the Nova Scotia Normal School Alumni Association was held at Truro, July 9th, in the Normal School building, the President, Miss Miller, presiding. After usual routine business, a resolution recommending the offering of a prize for the best essay on a selected subject, conditions to be determined by a special committee, was made, discussed and finally passed. The financial condition of the association was satisfactory, prospects of increased membership for the next year were very encouraging. An alumnus of the school, who is aware of the existence of the organization and does not make an effort to join its membership, has not the *esprit de corps* we would expect to see in the profession. The following were elected as officers for the ensuing year: *President*, Principal Calkin; *Vice-President*, Principal A. H. MacKay; *Secretary-Treasurer*, L. A. McKenna, Dartmouth.

From an educational point of view the meeting of the N. B. Institute, at Fredericton, in June, was an interesting one. The papers were all thoughtful and suggestive, the discussions admirable in spirit and in usefulness, and the tone of the meeting, as a whole, stimulative and progressive. Current movements of educational opinion were fully dealt with, without losing sight of the broad principles of sound general education.

The teachers of New Brunswick have reason to look with just pride on the progress which has been made in all departments of educational work, and no doubt many of them are indebted to the meetings of the Educational Institute for help and direction in their work. This meeting was full of such help and direction, and we hope that all future gatherings may be equally high in tone and purpose.

The schools throughout the Atlantic Provinces are again at work after the summer holidays, and it is encouraging to note the increased attendance, the better facilities for work in improved courses of study, in school buildings and apparatus. The teachers have been stimulated by these signs of progress, and enter upon the new school year with fresh zeal. Let us hope that all along the line there is a steady determination to use to the utmost the materials we have for increasing the efficiency of our common schools.

N. B. County Institutes: St. John County Institute meets at St. John (*not* at St. Martins as announced in the advertisement on another page), September 19th and 20th; Charlotte County, September 26th and 27th; Kings County, October 3rd and 4th.

We regret that in our last two issues the printer without our observing it omitted the last cipher in the amounts of the Junior Exhibitions and Bursaries in the advertisement of the University of Dalhousie. Although divided by ten the amount still struck the printer's eye as of sufficient magnitude. As these prizes are tenable for two years the amount won at a given examination is double the annual quotation. $8,500 (eight thousand five hundred dollars) may be won by students at the senior and junior matriculations held this month at the University. The pre-eminently grand feature of this great mine of wealth is that it makes the University course as accessible to the poorest in the land as to the richest, providing there is the genius. It largely eliminates the influence of material circumstances, and makes university success more generally a function of intellectual ability wherever it may be found.

The St. John's, Newfoundland, *Mercury* reports the discovery of a frog in Newfoundland. Is it an augury simply of political import, or is it a scientifically established fact?

The St. John's, Newfoundland, *Mercury* of the 27th August, has a valuable article, under the head "Have we any Partridges?" The answer is, "No, nor ptarmigan, properly speaking, either." There is not much in a name sometimes; but as the American Ornithological Union have agreed upon a definite nomenclature, it might be as well to give it as much currency as possible to obtain the uniformity sought for. We find that the genera *Colinus*, *Oreortyx* and *Callipepla*, not found in Newfoundland nor the Atlantic Provinces, although they are in the western portion of the Dominion, are called *partridges*. The genera *Dendrapagus* and *Bonasa*, represented here by *D. Canadensis* and *B. umbellus togata*, are called *grouse*. The former has also been noticed in the west of Newfoundland. The genus *Lagopus* constitutes the *Ptarmigan* according to this authority. According to Ridgway, there are two species of ptarmigan peculiar to Newfoundland. *Lagopus lagopus alleni* (Stejn), Allen's Ptarmigan, and *Lagopus welchi* (Brewst.), Welch's Ptarmigan. The *Mercury* ably and popularly shows how different environments have contributed to the development of the different genera of this group.

Our higher educational institutions are opening the new school year under most favorable auspices. Mt. Allison University was the first to fall into line with its resources taxed to the utmost to provide accommodation for increasing accession of students. The Halifax Ladies' College begins the year with an efficient staff of teachers and a large number of students. The N. B. Normal School sees one of the largest if not the largest class ever gathered within its walls. The Baptist Seminary, at St. Martins, opened this month with a new staff of teachers and an enrolment of eighty students. The N. B. University, Acadia, and Dalhousie will soon re-open, and the prospects for these institutions were never better.

ST. JOHN CITY SCHOOLS.

On Monday, Sept. 2nd, the teachers of St. John City met at the Centennial School. Senator Boyd, chairman of the Board, presided. It was the first meeting of the teachers of the united cities, and the eyes of Mr. Boyd glistened with good humor and satisfaction as he looked round on his largely increased family, and gave them his paternal blessing, mingled with words of good natured counsel. Secretary March, who for years has been performing the double duty of Secretary and Superintendent with a thoroughness and courtesy that has secured him the lasting esteem of teachers and trustees, has been transferring the duties of the latter office to younger shoulders. Superintendent Hayes enters upon his duties with a self-reliance and energy that promise to maintain and increase the efficiency of the St. John schools.

One object of the meeting was to introduce to the attention of the teachers the system of modelling in clay from wooden objects. Several teachers, who were the first to grasp the idea and put it into practice, gave the others the benefit of their experience. These pioneers are Miss Orr of the Victoria, Miss O'Sullivan of St. Malachi's Hall, and Miss E. Barlow of the Winter Street School. The explanation of their methods, given with the confidence inspired by success, was listened to with satisfaction by the assembled teachers. During this and the following weeks Supt. Hayes will hold meetings for further instruction among teachers of the same grades. If practical benefit is to come from this addition to the course of instruction it can only be secured by careful preparatory study.

The attendance at the public schools is very great. Nearly all the departments are full — some even crowded beyond their accommodations, and the Board of Trustees is already establishing some new departments in the city.

Not Irish, nor Scotch, nor Acadians; but Canadians.

We quote the following from a letter of His Grace Archbishop O'Brien, of Nova Scotia, published in *L'Evangeline*, Digby, Nova Scotia:

> Whilst on this subject I would wish to correct some false notions and dissipate some prejudices and misapprehensions. I cannot for one moment admit that less provision has been made in the Maritime Provinces for the education of our Acadian fellow-Catholics than for that of any other class All the schools of higher education in these provinces, established by the bishops, have been equally open to all Catholics. We cannot, so far as spiritual affairs go, admit race distinctions. We are simply Catholics; not Irish, nor Scotch, nor Acadians.

What is good in spiritual affairs is good in temporal affairs. His Grace, we understand, is at one with us here. While we consider it a good trait of character to be proud of one's descent and to honor the race, it is certainly mischievous to do so to the extent of retarding the fusion of races. The writer is proud to be one of the *Chlann na Gael*, not of that parasitic society of murderers, which, by natural selection, took upon itself the honored name of its unconscious host, as insect parasites often assume the color of what they prey upon for the sake of the temporary immunity it gives. He has enjoyed the book learning of a language which many have been only too ready to forget. But he would not go to the extent of claiming that Gælic should be taught in the schools of the Atlantic Provinces, because there are there 244,000 persons of Scotch descent. Nor would he propose that all of Scotch origin should attempt to perpetuate Scotch customs because they were Scotch; or to endeavor to keep themselves separate and distinct from people of other origin. And if any race has a right at all to make such demands, surely the loyal service of the Scotch element to the state, and its numerical proportions would place it ahead of all competitors. But such a disposition would be suicidal to the state, and ultimately so to the Scotch element. For like Ishmael, whose hand is against everybody, will soon have everyone's hand against himself.

In our schools teachers will often have occasion to notice race feelings, sometimes good-natured enough, at other times not so good-natured. Here will arise some occasions where the teacher can, in an oral lesson, deftly show up good points in the character of the English, Irish, French, Scotch, German or other races, and that we in Canada, having all these races, should develop their combined good virtues. The young Canadian should know that he should be the heir of the glories of all the peoples, and that, instead of endeavoring to keep his particular race distinct, he should make an effort to understand and appreciate good points in other races. The Englishman would then, probably, soon learn that he could have an associate in an Irishman, more intelligent and devoted than were he an Englishman. And the Scotchman might learn that the best supplement of his slow calculating nature would be the vivacity and spirit of the Frenchman. All our interests alike demand for their betterment race fusion.

It is hard at a certain stage to give up one language for another. But no matter what affection we may have for our old clothes we put them off when there is an advantage in putting on the new. But man's nature is just as reverently superstitious now as when the Druids sat under their oaks. The objects only are changing. There are some at this day who would die martyrs for our present unphilosophical, inaccurate and mischievous system of English spelling. Change it, and for them you destroy the beauty, nay, the very language itself. What a dying affection for old clothes: even for the thread-bare neckstock, which has so often choked and sometimes nearly decapitated us. Perhaps there is no people in this world to-day so superstitiously superstitious as those who have mastered English orthography *as it is taught*, and read bales of novels. We are not advocating the changing of our system of spelling now. We simply suggest that if English people think that Gælic, French, German, and other non-English tongues, spoken in this country, should be given up, as old clothes, when they cease to be economically used, they should be ready also to give up the antique and unhealthy wrappings of the English tongue as soon as they can be made to perceive the fact, providing the law of fashion, which requires the general concert of the leaders, is not violated. While we may have a word of censure ready on our lips for those who cling to the loved relics of their own small branch of the great tree of humanity, when they become, perhaps, rather an obstacle to general harmonious advancement, let us think, if we be not as great sinners ourselves. Closer acquaintance with others may show that they are even better than we. Let us not, then, forget on every occasion to attempt to draw closer those whom the mal-fortune of history may have separated. We are all of one blood. The same love will draw all hearts. The same Father has placed us together here, and will soon take us all away again together.

NEW CHAIRS IN THE N. B. UNIVERSITY.

The two new chairs of practical science that have recently been established in the New Brunswick University furnish gratifying proof that the university authorities are determined to keep up with the progress of the age. No less satisfactory is it that the young men selected to fill these important chairs are natives of the Atlantic Provinces and each has completed a university course of exceptional brilliancy.

Alexander Wilmer Duff, who has recently been appointed Professor of Experimental Science in the university of New Brunswick, took his B. A. degree at Fredericton encœnia of 1884, graduating at the head of his class with honors in mathematics. In the same year he won the Gilchrist scholarship, taking first place at the London University matriculation examination. He proceeded to Edinburgh where he graduated in 1888 with first-class honors in mathematics. In 1889 he won the Vans Dunlop scholarship in natural philosophy. The scholarship is of the annual value of one hundred pounds sterling and is tenable for three years. Mr. Duff is now in India where he intends to remain until May, 1890, holding the position of interim professor of experimental physics in the university at Madras. He will take the chair of experimental science in the University of New Brunswick at the beginning of October, 1890.

Allan Wilmot Strong, the new Professor of Civil Engineering and Surveying in the University, graduated in the Faculty of Applied Science in the University of McGill, in April, 1889, at the head of his class.

In addition to certificates of merit in designing and heat and heat engines, Mr. Strong, during his undergraduate course, was awarded the British Association Exhibition for proficiency in the theory of structures and mathematics.

At the degree examination he was awarded the British Association gold medal, having taken the first place in the advanced course of civil engineering. The subjects of examination were the higher mathematics and mathematical physics, and the higher branches of applied mechanics (strength and materials theory of structures, heat and heat engines, hydraulics).

Besides his college certificates, testimonials from the chief engineer of the Grand Trunk Railway and the resident engineer, under whom Mr. Strong worked, give proof of his practical knowledge of civil engineering.

TRURO KINDERGARTEN.

Miss Woodcock's resignation, to take a fine position in Hartford, Conn., where she had already labored four years, necessitated careful search for a worthy successor of proved ability and experience. Miss Twichell, of Haverhill, Mass., is the lady chosen to fill this important situation. Miss Simonds, who watches with intelligent interest kindergarten progress in Nova Scotia, endorses the lady most emphatically. Miss Simonds is accounted the most successful trainer in Boston, and her ideal of the kindergarten is so high that her word carries weight. Both Miss Woodcock and Miss Twichell are her graduates. Miss Woodcock's able services in Nova Scotia were acknowledged by a hearty and unanimous vote of thanks from the Educational Association, which met in convention in Truro, in July. The closing exercises of the kindergarten were heartily appreciated by all who witnessed them.

EDUCATION WEEK IN TRURO.

As the word "carnival" has by this time fully developed beyond its infantile, flesh-eating stage to the maturer age of plenary omnivorousness, where every thing not only can be, but is swallowed, we may safely call the second week of July in Truro the educational carnival week. First came on the closing exercises of the Normal School, naughtily spoken of as "commencement" exercises by some brethren of the press. True, it might have had some of the elements of the technical "commencement," but a great deal more of the popular "conclusion." However, in these piping times of peace, when we cannot turn the world upside down, we must invoke the mirage, sail our vessels with their keels in the sky, and gallop paradoxes over the plain.

Quadrupedante putrem sonitu quatit ungula campum.

Well, these closing exercises filled in Tuesday forenoon with a most interesting programme. In the afternoon an equally interesting but more novel sight were the closing exercises of the Truro Kindergarten affiliated with the normal school. Immediately after was held a meeting of the Kindergarten Committee, we might say, of the Frœbel Institute of Nova Scotia, and swift on its heels the annual meeting of the Alumni Association of the Normal School of Nova Scotia.

Tuesday Evening.

In the evening the first of the public educational meetings was held in the public lecture hall, under the auspices of the Alumni Association. J. B. Hall, Ph. D., vice-president, presided, and introduced

HON. J. W. LONGLEY,

Attorney-General of Nova Scotia, as the speaker of the evening. He first referred to the relations of the state to education in this province. He then expounded his theory of a good educational system, which was essentially in line with that of Herbert Spencer. The best education was that which made the most useful citizen — not merely the best scholar. The teacher instead of grinding out routine work should inspire the young with the idea of the responsibility of citizenship. They should be trained physically—in the principles of self-preservation — to give a sound mind in a sound body. They should be trained with a view to the earning of their bread, for the industrial development of the state. They should be trained in the knowledge necessary for the bringing up of families in the best physical and moral conditions for the perpetuation and growth of the state. The idea of being great should never be held as a motive before the young; only the idea of being useful. The dignity of labor should ever be upheld. He made a powerful appeal in favor of scientific training which would lay a good foundation for industrial science and art, successful farming, mining, fishing, building, invention, intelligent and therefore successful labor in every department of industry possible in this nature-favored country. He considered that for the great majority of people the study of the dead languages was a sheer loss of time. He wound up with an eloquent peroration on the possibilities of our country, and the historically proven fact that quality rather than the quantity of men determines the power of the nation.

Dr. Allison, Superintendent of Education, who was on the platform with the school inspectors and other representative men, in moving a vote of thanks, called attention to the evident trend of modern education as indicated in the able address of the Attorney-General. He intimated the fact, however, that a study of the statistics of our schools would show that in Nova Scotia at least there was not much reason to complain of the amount of time lost in Latin and Greek; while he complimented the classical training of the lecturer as one element in giving him his continental reputation as a speaker and writer.

Principal A. H. MacKay, in seconding the motion of thanks, referred to the tendency to worship the dead past, including the dead languages. Were the Hon. Attorney-General himself to die, we would probably find even his loyal opposition joining in the apotheosis. It is our nature. But if the dead languages have slain their hundreds, dead letters—dead as door nails—have slain their tens of thousands and are still slaying them. And he expressed the hope that in a short time dead letters could be as safely denounced from a public platform as the dead languages.

The chairman very gracefully tendered the hearty vote of thanks of the meeting to the hon. gentleman, whose powerful address placed him in the front rank of educational reformers.

The platform was then cleared and Part II. of the evening's entertainment came off according to the following programme:

1. SONG—"Fiddle and I," with violin obligata.
   Miss Sarah Crowe. [*Mrs. Arthur Goodsoe*
2. READING—"Guinevra."
   Miss May Usher Griffin.
3. SONG —— —— *Selected*
   Miss Crowe.
4. READING—"4th of July celebration at Jonesville,"
   Miss Griffin. [*Josiah Allen's Wife*
5. SONG—"The Resurrection," violin obligata.
   Miss Crowe. [*Harry Rowe Shelly*
6. READING—Scene between Mary Stuart and Queen Elizabeth,
   Miss Griffin. [*Schiller*

Miss Dodge and Mr. A. C. Patterson, accompanists.
National Anthem.
Choir.

Wednesday Evening.

The public meeting next evening was attended by as crowded a hall as on the first night. This meeting was held under the auspices of the Educational Association which was in session during the day and on the day following. Dr. Allison, Superintendent of Education, was, therefore, in the chair. His Lordship Bishop Courtney with leading educational gentlemen were on the platform.

Hon. D. C. Frazer

was introduced as the principal speaker. His subject was "Our Common Schools," which he discussed under such heads as their object, their equipment, and their independence. His treatment of the subject was very effective, and was specially adapted to the teacher. But trustees and even higher officials came in for some very pertinent advice. The freedom of our schools from denominational control was one great advantage enjoyed. This did not mean the prohibition of religious teaching. It meant the cheapening and advancing of secular education, by all combining to work for common wants. It meant the elevation of religious teaching by relegating it to the various churches, where by means of domestic instruction, Sunday schools, or religious classes, the instruction could come directly from the respective authoritative sources.

His Lordship Bishop Courtney followed in a very pleasant and fascinating speech. His manner was quiet, his illustrative points most apt, and brimful of humor he went on increasing in earnestness until he reached his final and main argument. The clergy were teachers, therefore he was of their number. But when a clergyman read up everything until he was forty, then imagined he knew enough for his congregation for ever, he would perhaps be surprised to see that when about fifty the pews would begin to become empty. Children and parent will tire much more readily of the teacher who is not constantly adding to his knowledge. He criticized particularly defective enunciation and pronunciation in such schools as he had visited in this country, although he by no means complimented the rhetorical declamations in the schools south of the boundary. And finally he laid great stress on the use of the Bible as a text-book in the public schools. He thought any objections as to the use of it could certainly be overcome by arrangement between the heads of the various Christian denominations. His lordship's argument was put as forcibly as any man or council of scholars could put it. But the reception of it by the audience conveyed the strong impression that they felt a few years longer stay in Nova Scotia would result in his lordship's complete attachment to the views so well expressed by the Hon. Mr. Fraser.

The president in commenting on the views of the speakers shortly and deftly defended the provincial system at any threatened point. He called on Principal Oakes, of Horton Academy, who until the present year was an Inspector in the province of New Brunswick, and as representing that province on the occasion. Mr. Oakes made a short and appropriate reply. Votes of thanks were then as usual presented to the speakers and the ladies who furnished the interlude music.

In the absence of Hon. Mr. Fraser, his lordship humorously and gracefully responded in behalf of all.

On the morrow, Thursday, at 5 p. m., the convention closed, and we returned home revolving many curious ideas suggested by so many and so various leading minds in this great carnival of educational thought. Although all were not moving in the same direction, there was a strong general drift. There were swirls and eddies playing on the surface, but the great river was moving on.

NOVA SCOTIA KINDERGARTEN CLOSING.

This event took place on the afternoon of July 9th, after the closing exercises of the normal school. The Truro kindergarten has, to a certain extent, been used as a provincial institution — the students of the normal school having access to it as a model school, and receiving special instruction from the teacher in a course of lectures. The crowd of visitors was so great on this occasion that hundreds who endeavored to see the exercises could not gain admission to the room. To those who were fortunate enough to obtain entrance the performance and the spirit of the little ones were delightful to witness. Mayor Muir delivered an address at the close, in which he referred to their successful closing of the second year. The committee hoped the present teacher, Miss Woodcock, could see her way clear to remain another year with them, although there were strong inducements abroad. We trust the people of Truro, who have received a greater impetus in starting a kindergarten than any other town in the province can expect, may show themselves worthy of the advantage conceded to them on account of the locus of the normal school. The Froebel Institute, of Nova Scotia, and especially its enthusiastic president, have worked hard for the advantage of Truro, with the object also of benefitting the province. Truro has gained a very important advantage. Shall the province have the benefit? We can suggest another locus where the people will do their duty.

CONFERENCE OF HEADS OF COLLEGES.

In our present issue there will be found a report of the deliberations of the Heads of Colleges in the Maritime Provinces, at Wolfville, on the 3rd and 4th July.

Some of our readers, and many of those who were present at the Interprovincial Convention which was held at St. John last year, will remember that one of the most notable and immediate results of that gathering was the informal but most interesting meeting of the presidents of the colleges in the Maritime Provinces. The morning session of the second day had been set apart for the teachers of the various grades to meet in sections and read papers and discuss them. It happily occurred to some of the college representatives that they might profitably devote the same morning to an interchange of views and experience on matters relating to college work. All the presidents and professors who were present at the Convention heartily responded to the proposal, and so pleased and satisfied were they with the result that they resolved to repeat the experiment next year.

Accordingly, on the invitation of Dr. Sawyer—the chairman of the improvised meeting referred to above—a good representation from the colleges of the Maritime Provinces met at Wolfville, in July, constituted themselves a Conference of Heads of Colleges, and proceeded to discuss questions of great moment, not only to the well-being of the colleges but to the advancement of educational interests in general, and to devise means by which the highest institutions of learning in the provinces and the high schools and academies of the government systems might be brought into proper relationship.

From an examination of the business transacted we observe that the first resolution is directed against an anomaly which has long existed in the irregularity of the standard of the examination for entrance at the various colleges. Manifestly to remedy this defect in our educational procedure and to establish a uniform condition of admission to all our colleges would not only do much to systematize our higher education but simplify and render more efficient the work of the high schools and academies. The intention of the matriculation examination is that the faculty may be satisfied that the candidates who present themselves have a requisite amount of knowledge, and that they are capable of participating in the higher studies of the university. To the high schools and academies the university looks for the performance of this preparatory work of fitting pupils to undertake its more advanced academic pursuits. And surely it is only reasonable for the intermediate schools, on the other hand, to expect from the universities a well adjusted, comprehensive and precise statement of what they think necessary for the purpose. But, above all, they are justified in looking for unanimity in the demands which are made upon them, that their teachers may feel that the studies in which their pupils are engaged are such as shall meet the requirements of any university in the Maritime Provinces.

But these secondary schools are not merely fitting schools for the university but are intended to complete the education which, in its earlier stages, has been received at the primary schools. To the great majority of the pupils who attend the high schools, the education which they there obtain ought to be of such a nature as to be immediately available for the purposes of life. And hence the curriculum ought to be broad enough to be serviceable for the immediate and prospective needs of the pupils who then complete their education, as well as adapted for the qualification of such of their number as desire to proceed to the university. And here the co-operation of the superintendents of education is both necessary and valuable. And we doubt not but the representatives of the colleges and the superintendents together will agree upon such a test for matriculants as shall stimulate to greater efficiency the intermediate schools of the provinces, and that without impairing their value as final and finishing schools for the boys who have in prospect such a career as is opened up to them through the farm, the machine shop, or the counting house.

In the second resolution we welcome a very opportune and somewhat emphatic opinion respecting the conferring of degrees on candidates who have prepared themselves for examination by private study. The university degree is not only an expression of satisfaction with the knowledge of the student as exhibited by him in his examination papers, but it also certifies to the fact that he has pursued his studies under the direction of qualified instructors, that he has passed through a course of severe and salutary discipline, that by the constant contact with superior minds his character has been formed and his intellect brightened, and that he leaves the university stamped as qualified by the culture and training of the schools to employ advantageously the faculties with which he has been endowed. If, therefore, the university degree be obtainable by examination, without attendance on lectures, it ceases to provide a guarantee for the possession by the student of that culture and discipline which are the highest aims of university teaching.

The subjects of athletics, examinations, and the standard adopted at the various colleges in the examinations for degrees appeared to have also occupied the attention of the Conference. Athletic sports do not, as a rule, require much pressure on the interest of students. They need, however, wise regulation and careful supervision. To the subject of examinations we directed the attention of our readers some months ago, and notwithstanding all that has been written respecting them in the interval, we see no reason why we should adopt a different view from what was then expressed. If examiners were judicious, accomplished and experienced men, and the limits of the examination reasonable, we do not doubt but much of the dissatisfaction which is now so general would disappear. At the same time we would also express our conviction that much advantage would be gained by conducting part of the examination orally. But the merit of this recommendation is greatly dependent upon the skill of the examiner and the coolness of the student under examination.

We are, perhaps, at some distance from a common standard of examination for degrees, but it is very gratifying to observe the interchange of examiners between universities — that the professors of one university have been invited to assist in the examinations at another. Such academic courtesies cannot but be productive of good, and must prove to the public that the only rivalry existing among the different colleges is that healthy emulation, each to excel the other in the quality of the service they render to the cause of higher education.

We also consider the deliverance of the Conference respecting the proposal of the government of Nova Scotia as well timed and eminently becoming. Private benefaction has done a great deal in recent years for university education in Nova Scotia, but in a new community the gifts of munificence cannot be expected to meet all demands. Such an expenditure as that indicated by the government would, adopting the words of the resolution, "benefit the high schools and academies of the province and tend to assimilate and consolidate its collegiate work."

With pleasure and satisfaction we hail the announcement that the Conference of Heads of Colleges is now a duly constituted body and that it shall meet annually for the transaction of business.

As our readers must have observed, the printers, in the absence of the local editor, published in July the notes on the "Natural History of the Atlantic Provinces," from which the June article was compiled.

THE SCHOOL TRUSTEE.

In Nova Scotia the annual school meeting in each section must be held on the last Monday of September. A new trustee is elected in place of the retiring one on the board of three. Without any pecuniary reward these men have to manage the affairs of the school section for three years before their term is ended. Much time has to be spent, and sometimes much anxiety endured and even annoyance experienced. And in addition to all this, at the annual meeting they have to meet the criticism, especially of people who have no interest in education, whose object is to keep down the taxes—even should it also keep down the school. When the estimates are brought down they attack every item on the principle that if they challenge everything something may perhaps be cut off. They do not at all consider what the intelligent trustee, who is responsible perhaps for the future progress of that section, has on his mind. While Sec. 45 of the Manual, or 49 Vic., Ch. 14, 1886, states that "any other expense required in providing an efficient school or schools shall de determined and levied," they cannot think of any other than the salary of a teacher and the fuel for the winter. To have an efficient school there must be a healthy, comfortable and passably beautiful school-room, with a fair amount of apparatus. To enable the trustee to be posted in the general work of education so as to keep the school up to the times in the most economical manner, it is absolutely necessary that they read regularly some leading educational papers. With the other taxes put upon the time and money of the trustee is it not fair? And is it not necessary, in order to have a thoroughly efficient school, that the section should include some leading educational papers for their gratuitously laboring trustees, while they are making provisions for maps and other apparatus for the school? We would like to have the privilege of talking to every school trustee in the provinces, as well as to the teachers. And we should have no objections to have them talk back to us, if we did not made our case good. Certainly no harm could come of it, and much interest and benefit to all concerned would result.

YOUNG people should learn languages as dogs learn to swim; fling them into the water and let them plash about. Depend upon it, they will not sink to the bottom.—*Prof. John Stuart Blackie, in the June Forum.*

Provincial Educational Association of Nova Scotia.

The Annual Convention of the Provincial Educational Association of Nova Scotia was opened at 9.30 a.m., on Wednesday, July 11th, in the convocation hall of the normal school at Truro. The attendance was very large, nearly four hundred from the various quarters of the province having been enrolled. The president's countenance was beaming with satisfaction, and his periods were more sonorous than ever. From beginning to end there was not a single unpleasant hitch, although most important matters were discussed, and lively passages at arms were enjoyed.

The financial report of last year, which was satisfactory, was referred to Inspector Morse and Mr. McKenna as auditors. Supervisor McKay, of the Halifax schools, was then elected secretary, and R. J. Wilson, Esq., assistant-secretary.

Dr. Allison, Superintendent of Education, gave the opening address as presiding officer, in which he referred to what he had observed when attending the National Association of the United States two years ago, and his experiences at the Interprovincial Convention of the Atlantic Provinces of Canada, last year, and the history of the work of the Provincial Association, and concluded from all that we were making very substantial progress. The keynote of all our work here of course was more progress.

EDUCATIONAL OBSTRUCTIONS.

He then introduced the first essayist, A. McN. Patterson, A. M., principal of Acadia Villa Seminary, who treated of "Obstructions in our Educational System." The Importance of our Work: Fashioning the Temporal and Eternal Characters of 100,000 Future Citizens. Great Pioneers: Sir William Dawson, Dr. Forrester and Sir Charles Tupper. Definition of a Good System, that given in the June number of the EDUCATIONAL REVIEW: "The best education is that which makes man the most useful. The highest culture is the one which in the long run makes man the happiest and best servant of his race." Obstructions: License given to teachers who have no real interest in teaching work — teaching for money; to teachers who have no training; to teachers who do not appreciate the enormous importance of moral development, of patriotic sentiment. The profession should be protected from the dabbler. Good men should be kept in the profession by good pay and promotion. He fired into the executive and inspectoral departments a few solid shots, which would take effect chiefly in quarters under cover, where there was not sufficient interest shown to arouse the people by lecturing, or even to come together in convention for mutual stimulation. We have not space even to outline this admirable address.

Inspector Condon, with spirit, threw down the gauntlet in behalf of some of the challenged obstructionists. In a keen and humorous manner he pointed out the difficulty of finding out the proper teacher by any other method than by trial. The people are rapidly becoming more educated, and are yearly becoming more critical in their judgment of the perfunctory teacher. The proper teachers are in the process of being found out. As to the inspector's powers of arousing the people by lecturing, he thought Mr. Patterson was the man to make an inspiring lecture tour through the province.

Dr. Allison emphasized the fact that the teacher was not the sole custodian of the morals of the pupils. There were the parents, the church, the Sunday-school. Still, the government were very determined to have no immoral individual in the profession; and in accordance with that determination thay had not been slow to cancel several licenses upon evidence of immoral deportment, and shall continue so to do.

A CHARMING TONIC-SOL-FA EXERCISE

with a class of young pupils, was then conducted by Miss Crowe, of Truro. It evidently convinced all that the simplicity of the system will very soon make it our public school system. From its success in Toronto and Halifax we may expect shortly to follow Great Britain and the many of the best schools in the United States, in adopting it as a compulsory subject in the Nova Scotian schools. Look out, non-musical teacher! But there is hope for even you in the tonic-sol-fa system, they say.

COURSE OF STUDY.

The second paper of Wednesday forenoon was Prof. Eaton's discussion of the "Course of Study." This was, perhaps, the most important subject under consideration at the Convention. The object of the paper was to secure a committee for the consideration and revision of the course. *First*, as regards its constitution; *second*, as regards its administration. He suggested the laying of more stress on the acquisition of good language than the technical elements of grammar in the earlier stages, the confining of exercises in number to such as pupils could fully comprehend; called attention to the omission of modelling as the complement of drawing, the elements of manual training and vocal music from the detailed course; advised the formulation of courses of study for the miscellaneous schools, the partially graded schools, as well as for the fully graded; and criticised the lack of co-ordination between the syllabus of the teachers' examination and the courses of study for the common and high schools.

Wednesday Afternoon.

At two o'clock Sergeant-Major Bailey put a company of twenty-four bright Halifax boys through a course of calisthenic drill, amid the applause of many hundred spectators. They were addressed for a few minutes by Principal A. McN. Patterson on the value of good physical development. He rounded off with ringing, good, patriotic sentiments, which were apparently appreciated to the full by the future Halifax citizen as well as by the general audience.

Civics.

"Civics in the Schools" was ably treated by Prof. Tufts, of Acadia College. He reviewed the rise of civics in the schools of the United States, outlined its principal divisions, and presented the subject in a much more complete form than would be necessary simply for the elements required in the common and high schools. This paper, discussed in connection with the proposed revision of the course of study, elicited a brisk discussion, led by Principal Calkin, of the normal school; President Forrest, of the University of Dalhousie; Professor Seth, of Dalhousie; Principal MacKay, and others, whose names were not repeated from the chair.

Transfer Examinations.

In line with the consideration of the course of study this subject was briefly treated in a paper by Principal Cameron, of Yarmouth, read in his absence by Mr. Porter, of the Truro Academy, and more fully discussed by Principal H.S. Freeman, of Amherst Academy. Mr. Freeman's vigorous treatment of the subject roused a very breezy discussion on examinations in general. President Forrest and Superintendent Allison tilted in full tourney, while Principal Calkin, Inspectors Lay and Condon, Professor Eaton, A. H. MacKay and others, joined in the general fray. The result, under the admirable directing genius of the president, was a very full exposition of the *pros* and *cons* for the benefit of the future committee on the revision of the provincial course of study. In the evening one of the series of public educational meetings, elsewhere described, under the auspices of the association, was held in the lecture hall of the Y. M. C. A. building.

Thursday Forenoon.

The Convention met this forenoon in three sections, the academic, common and primary schools. While three times the amount of ordinary work was done by this arrangement a great deal of dissatisfaction was necessarily caused, by the impossibility of following more than the work of one section at a time.

Academic Section

Principal Smith, of Digby Academy, in the chair, and R. J. Wilson, Esq., of Halifax, secretary.

Prof. Smith, of the school of agriculture, read a very superior paper on "Natural Science in the School." He spoke from his experience, and from his interest in the development of agriculture. Classics need not be expunged from the high school. There is a place for it. But certainly natural science should have a high position. The prosperity of the country depends more on the scientific training of our people than on their literary knowledge. Natural science should be introduced from the earliest stages by object lessons on minerals, soils, plants, insects, common chemical reactions, so as to induce the habit of accurate observation and close reasoning, based upon well-tested facts. The study of any subject, Sanskrit or Gælic, would be of value as a mental discipline. But studies, which, while disciplining the mind, give also a practical knowledge of the nature of the world from which we must win our bread, have much stronger claims on our attention for general public use. No outline of this valuable address can be given here.

Principal George Miller, of the Hantsport high school, read a brilliant paper on "Academic Diplomas," followed by Professor N. C. James, of the Halifax Academy, with a masterly treatment of the subject in its various bearings. We have not space for a summary that would do justice to these gentlemen. We trust their papers may soon be had *in extenso* in the printed annual report.

Principal Oakes, of the Horton Academy, lead in the discussion of these papers, and was followed by Principal Miller, Principal A. H. MacKay, Principal Calkin, Principal W. R. Campbell, of Truro Academy, Mr. Torey, Professor Eaton and others. The general consensus appeared to be in favor of the assimilation of the syllabus of the teacher's examination with the high school course, and the examination of the high schools by a provincial board of examiners, whose diplomas of the first, second and third year course would also stand for the non-professional work respectively of teachers of Classes D, C, and B, for instance. The discussion took in a wide range, and was closed by a resolution to memorialize the Council of Public Instruction in reference to the whole matter.

Common School Section.

Principal Slade in the chair. "Language in Grades 3, 4, 5 and 6" was the title of the paper read by Miss Burgoyne, of Windsor. The subject was treated in an eminently practical manner, and was one of the most useful before the Convention. In a most effective manner the essayist pictured the method of the successful language teacher. He must be the text-book himself. His language must be pure and accurate.

In the course of Grade 3 the study of language might be classified as follows: (1) practice in enunciation and reading; (2) correct forms of speech; (3) sentences and their essential parts; (4) nouns, verbs, etc.; (5) practice in easy sentences. In the first division great care and practice is necessary. If we seek a definition of a word we find something like this, "a word is an articulate sound." It is useless to give that definition to a child. A practical distinction must be given between a sound and an articulate sound. Under the third head teachers find the greatest difficulty. It is hard to make a child understand the difference between a sentence and a phrase. It may be well to give the definition first and then ask the pupils to write some words on the black-board. Perhaps they will write the words "on the hill." Is that a sentence? No. Why? Because a sentence expresses a statement. Then ask another pupil to made a sentence of it. Possibly it will then read, "the house stands on the hill." Is that a sentence? Yes. Why? Because it expresses a complete statement. The fifth head comprises all the others. Call upon a pupil to tell you something he did; something he did not do. Tell him that this is a declarative sentence. By a like process explain operative, interrogative and exclamatory sentences. Write these on a board, and make all the students spell them. Then let them turn away from the board and spell these words, insisting on clear enunciation. It may be advanced that enunciation does not pertain to a study of grammar, but if grammar teaches the correct method of using words in speaking, surely the right method of pronouncing a word goes hand in hand with grammar. A sixth head may be made of composition on abstract and other subjects. Ask a pupil to tell a story, and another to repeat it. For variation, ask them to tell as much as they can about a lecture or a lecturer. I have seen some reports worthy of the press. Then instruct them in letter-writing. Let them write letters to their teachers or their friends. Poetry forms a very important branch of language. In this branch of the study let them learn poetry by heart, but be sure that it is something worth learning. I do not think that paraphrasing is to be commended. Thoroughness should be characteristic in all our work. Drill and review may be tiresome to teachers, but it is not to children. He who reviews and reviews, drills and drills most, is most successful. We must not be in a hurry. The growth from nature is slow, and so it is with intellectual growth. Haste will ruin our best plans.

The paper was followed by speakers, among whom were Dr. Hall, Inspectors McDonald, Lay and Morse, Miss Miller, and Mr. McKenna. A letter from Principal E. MacKay, of New Glasgow, was read at this stage, expressing regret at being unable to prepare and deliver his paper on "The Duties of Principals.' A paper on "Arithmetic in the First and Second Grades," prepared by Miss Church, was then read by Professor Eaton, and spoken upon by Inspector Condon.

Primary School Section.

Inspector Condon in the chair. Principal Campbell, of Truro Academy, and Miss Patterson, of the Truro kindergarten, read excellent papers in this section, on the Kindergarten in the Primary School. There is no doubt but that the day is not far distant when the kindergarten method will be adopted in principle in all good primary schools. More than that, the principle at the root of good kindergarten training should be carried out right along through the university. Effective faculty development.

Thursday Afternoon.

The President, Dr. Allison, in the chair. After the minutes of the various sections were read and announcements bearing on the meeting of the Summer School of Science made, Principal Calkin, of the Provincial Normal School, moved a resolution to the effect, "That this Association place on record its high appreciation of the Educational Review." The resolution was seconded and supported in very complimentary terms by Professor J. B. Hall, Ph. D., Supervisor McKay, of the Halifax schools, and by Dr. Allison, Superintendent of Education, and was unanimously adopted. It might be mentioned here that this spontaneous compliment from the great Provincial Association of Nova Scotia has an evidence of genuineness, in the fact that Nova Scotia leads all the other provinces with the largest subscription list.

Professor Eaton then moved the resolution, of which he had previously given notice, "That a committee of seven be appointed to take into consideration the advisability of revising the present course of study laid down for the public schools." It was seconded by Principal Campbell. Discussion followed, during which it was agreed, on the suggestion of A. H. MacKay, that the recommendations of the academic section be also referred to this committee; and on the suggestion of Inspector MacDonald, that "a one-termed school year, commencing say about the first of September and ending about the first of July" should also be referred to them. Carried without opposition. President Allison reserved the selection of the committee for the future — until he had time for fuller consideration of the representative character of its *personnel.*

A letter from Prof Eaton, of McGill University, Montreal, advocating an Interprovincial Convention for all Canada, was referred to the Executive on motion of Inspector Lay.

The ballot for the seven who, with the *ex-officio* president and vice-president (superintendent of education and principal of the normal school) and the secretary already elected, should form the Executive Committee, was then taken.

While the ballots were being counted, Rev. James Anderson, A.M., read a paper on the new tonic-sol-fa system.

He called attention to the fact that while 990 out of 1000 had the power of singing, a much smaller proportion could sing. Cause, chiefly the difficulty of mastering the notation. The superior advantage of this simple system he proved by the most indisputable evidence. By its means a child can learn to read music which an adult, trained in the staff notations would find difficult to read on his favorite staff. Mr, Anderson gave a brief outline of the subject; but was cramped for time as the adjournment was approaching, and some members were leaving to catch the trains. His work in Halifax city is an undoubted evidence, however, of the superiority of the system. The evidence is so plain that general expectation sees the tonic-sol-fa system already on the teachers' syllabus.

The scrutineers of the ballot reported the following elected to the Executive: A. H. MacKay, Miss Burgoyne, Inspectors Lay, McLellan and Condon, Professor Eaton and Principal Freeman.

The president's chair at this stage was taken by Vice-president Calkin.

Mr. A. H. MacKay moved, That the Provincial Educational Association of Nova Scotia record its very great appreciation of the services of Miss Woodcock, as principal of the Truro and Provincial Kindergarten, through which she has conferred material benefit in the matter of primary education on the whole province. He expressed regret that the superior advantages of wealthier centres of population tended to take from us those who became eminent in their special work; but he was assured that the best wishes of one and all followed Miss Woodcock to her new sphere of labor. The motion was supported in similar terms by Supervisor McKay and Principal Calkin, and passed. Then followed short farewell addresses.

After the customary votes of thanks to railway and steamboat authorities, to the press and those who supplied music at the public educational meetings in the evening, the tenth and best convention of the Provincial Educational Association of Nova Scotia stood adjourned, *sine die*.

Intercollegiate Conference.

A conference of the heads of colleges in the Atlantic provinces was held at Wolfville, on 3rd and 4th July last. The conference met in the library of Acadia College. There were present Presidents Sawyer, Acadia College; Forrest, Dalhousie College; Inch, Mount Allison College; Willetts, of Kings College; and Principal Anderson, Prince of Wales College, P. E. Island. The conference was organized by the appointment of Dr. Sawyer, president, and Dr. Anderson, secretary.

The president read a letter from Dr. McNeil, the president of St. Francis Xavier College, Antigonish, in which he expressed regret at his inability to be present, owing to other engagements, and the readiness of "St. Francis Xavier College to co-operate with the other colleges in anything in which co-operation is practicable." The president also informed the conference that a telegram had been received from President Harrison, New Brunswick University, who had previously intimated his intention to be present, stating that he could not attend the meeting in consequence of the call of other duties.

The following resolution was submitted to the the conference by Dr. Inch, and, after discussion unanimously adopted:

> That in the opinion of this conference it is desirable that a common standard of matriculation should obtain in all the colleges in the Maritime Provinces; that for the purpose of deciding upon such requirements for matriculation, the superintendents of education for the provinces of Nova Scotia, New Brunswick and Prince Edward Island be invited to meet representatives from each of the colleges in a convention to be held at a convenient time and place; and that in the meantime we recommend that certificates of examination from the principals of approved high schools and academies in the three provinces named be accepted *pro tanto* by the faculties of the colleges, in lieu of the usual matriculation examination.

The secretary was requested to communicate the first part of the above resolution to the superintendents of education of the three provinces.

The subject of the conferring of degrees on non-resident students was introduced by Dr. Willetts, who embodied his views in the following resolution, which was accepted as expressing the opinion of the conference:

> That in the opinion of this conference it is undesirable that the B. A. degree examination should be open to non-resident students.

A conversation at this stage ensued, in which ideas were interchanged upon athletic sports, examinations, and the standards adopted by the various colleges in the examination for degrees.

The following deliverance was offered by Dr. Inch, upon the proposal of the government of Nova Scotia, respecting scholarships and fellowships, and cordially approved of:

> That the conference recognizes in the principle of the measure proposed by the government of Nova Scotia to establish a system of scholarships and fellowships for the encouragement of collegiate education, both undergraduate and post-graduate, a desirable and efficient means of not only promoting the objects aimed at, but also of benefiting the high schools and academies, and tending to assimilate and consolidate the collegiate work of the provinces.

It was then proposed and unanimously agreed to, that the conference meet next year at Windsor, on the first Wednesday of July. The Conference then adjourned.

N. B. Educational Institute.

The N. B. Educational Institute met in session in the hall of the Normal School, at Fredericton, June 26th, 27th and 28th. Nearly 250 teachers attended its sessions, which were marked by a number of instructive papers read and many interesting debates. Chief Supt. Crocket presided, and H. C. Creed, A. M., was re-elected Secretary and W. C. Simpson Assistant Secretary. The following is a list of *ex-officio* members of the Executive Committee elected by the Institute: Miss L. J. Gregory, Fredericton; Mr. J. M. Palmer, B. A., Fredericton; Mr. Philip Cox, B. A., Newcastle; Miss Bessie L. Barker, Scotchtown, Queens; Miss Jennie Lyle, St. Stephen; Mr. Frank H. Hayes, St. John; Miss M. Maud Narraway, St. John; Mr. George H. Harrison, B. A., Chatham; Mr. Frank A. Good, Edmundston; Mr. Geo. A. Inch, B. A., B. Sc., Fredericton. A resolution, recommending the Board of Education to make members eligible to the Provincial Institute without being members of a County Institute was passed unanimously. A resolution was also adopted asking the Executive Committee to prepare a plan looking to a change in the mode of electing the *ex-officio* members of the Executive Committee.

The public meeting in the evening was largely attended, and addresses were delivered by the President, Supt. Crocket, and by Sir John C. Allen, Hon. Judge King, Attorney-General Blair, Dr. Harrison, President of the University, and His Worship Mayor Allen. The latter welcomed the teachers to Fredericton and invited them to visit the chief places of interest. Superintendent Crocket dwelt upon the importance of the teacher's work and the questions they were called upon to discuss in the Convention. Sir John C. Allen referred to the changes that had taken place in the teachers' work and their position in the last twenty years, and recalled many interesting incidents of his early school days. Dr. Harrison advocated a closer connection of the university with the schools of the Province, and thought the time had come when a higher standard for matriculation should be insisted upon.

His Honor Judge King, after referring to various phases of educational work in the province, spoke of the necessity of some scheme of higher education for the efficient maintenance of our common schools. The remarks of the superintendent in his report had impressed him very much. He did not wish to interfere with the government in their legislation, but thought that the adoption of such a scheme as the one proposed must result in great advantage to our educational system. The difficulty was no doubt one of finance, and he felt that if the financial condition of this country would admit it there could be no better thing done. He had read with much interest and very carefully the scheme laid down by the superintendent, and thought that it had been admirably conceived. The cause of education could not be properly maintained by the common school alone, because the education of those on the surface below must be dependent upon those in the plane above, and there must be something to lead up so as to have a constant circulation from below to above, and from above to below. If we had this we would have something that would leave its impress upon the whole country.

Hon. Attorney-General Blair also referred to the matter of secondary education, and said the financial aspect was not the only difficulty in pressing forward this work. The government had also to convince the people that it would be to the interest of the country to adopt a scheme of higher education. Though deeply impressed with its importance the government had not yet been able to take such steps as would insure its adoption.

A select choir, under the managemont of Professor Bristowe, furnished appropriate music.

On Thursday morning, Principal Mullin, of the Normal School, read a paper on "The Demands which the Common School is making on the Teacher."

Mr. W. M. McLean read a paper prepared by Mr. G. U. Hay, Principal of the Victoria School, on "Composition and Critical Reading *versus* The Formal Teaching of English Grammar." This paper was discussed freely, the writer having urged that too much attention was given to mere formal methods in teaching the English language, and urging that the amount of time now given to the subject be lessened, and that grammar be taught through the written compositions of the pupils and a more general and careful study of English classical authors, which could be continued from stage to stage of the pupil's progress,

Mr. Frank H. Hayes, Superintendent of the St. John schools, read a valuable paper on "Compulsory Attendance at Schools." A committee was nominated to formulate the views of the teachers on this matter. Later, their report was read which was to the effect that the Board of Education be memorialized to prepare and submit to the legislature, at its next session, a scheme which will control the absenteeism and non-attendance at school of pupils from insufficient causes. This was unanimously adopted. This was one of the most important acts affecting the school service done at the Institute.

Mr. Brittain, of the Normal School staff, gave a very instructive lesson in clay modelling, and deduced from the model the principles of drawing. The child is allowed to model for himself, which he soon learns to do.

Mrs. Philips, of the W. C. T. U., read a paper on "Scientific Temperance Instruction in the School."

Mr. McFarlane, Principal of the St. Stephen High School, read his paper, "Is the Common School meeting the Demand for Practical Education?" He objected to teachers being engaged in two professions at the same time. Many of our teachers are simply using the profession of teaching to sustain them while they are privately or publicly preparing for other duties. He also urged that teaching should be more practical than it is.

On Friday morning a resolution was passed urging upon the Board of Education the necessity of changing the school terms from their present dates to their former ones.

Mr. Philip Cox, B. A., of Newcastle, read a thoughtful and able paper on "Public School Education—its Relations to Political, Social and Moral Tendencies of the Times." He made reference to the lack in our reading-books of so little matter referring to Canada, with nothing of reference to our great men, which loss affected the up-building of patriotism in the minds and hearts of the pupils.

A resolution commending the Educational Review to all teachers was carried unanimously

Mr. S. C. Wilbur, B. A., of Moncton, read a brief paper on "The Superannuation of Teachers." A committee was appointed to report at the next Institute on its suggestions.

On Friday afternoon a geological excursion under the charge of Dr. Bailey, of the university, went to Currie's Mountain, about ten miles above Gibson. The party spent the whole afternoon in exploring the geological formations of the district, and was afterwards addressed by Dr. Bailey from the top of the mountain on some of the more important features that were met with. The excursionists are all loud in their praise of Dr. Bailey, for his kindness and the excellent manner in which he pointed out and explained the peculiarities of the rock formations.

At the closing session, Mr. G. J. Oulton, of Dorchester, read a very suggestive paper on a "Programme for Friday Afternoon." Mr. Oulton claimed that every Friday afternoon should be set aside in the schools for the carrying out of a special literary and musical programme to be superintended by the teacher. These exercises should be of a different nature from the ordinary days. The school should be made a kind of literary society on that afternoon of each week, and it would be found that, if it were managed properly, it would be a valuable service to the pupils. In order to get the children properly interested, the exercises should be made as pleasurable as possible. Original essays might be read, recitations could be given, and dialogues and debates engaged in. A question box might also be arranged. All children not deaf or dumb could learn to sing. Poetry should be committed to memory, as should also choice quotations. The teacher should endeavor to inculcate a taste for sound literature.

Inspector Carter followed with a paper on "Industrial Education," pointing out the need for manual training and the maintenance of schools for that purpose. Such schools were the greatest educational demand of the times.

In commenting upon this paper, Mr. John March, Secretary of the St. John Board of Trustees, gave a very interesting account of a visit he made to an industrial school in Boston. In this province we could not have such schools, but our present system of modelling in clay and paper was a step in the right direction. He thought that a set of the tools in the various trades should be in every school room and their use explained.

Votes of thanks were passed to those who had furnished papers, to Dr. Bailey, and to the president, Superintendent Crocket. The Institute then adjourned, being one of the most interesting and largely attended ever held in the province.

Clark University, at Worcester, Mass., will open October 2nd, 1889, with Dr. G. Stanley Hall as its president. There are to be classes in mathematics, physics, chemistry, biology and psychology. The students will include (1) those who have taken the Ph. D. degree in this country or abroad; (2) those who are aiming at this degree; (3) special students not seeking degrees; (4) medical students. There will be about thirty scholarships founded. The aim of the institution is to supplement the work of the college.

Chronicle of the N. S. Summer School of Science, Third Session, Parrsboro, 1889.

Here came the professor weary from his college work, and perhaps longing for an independent roving life, to collect material for some paper or monograph, and recreate himself at the same time. But with the routine of elementary work, even he had recreating rambles in new fields, and in addition the opportunity of meeting scientific and literary fellow-workers who were as lovable and jolly as if their brows never wrinkled in the tussle to enter the arcanum of Nature. Here came the teacher and student, the heroes of the profession, tottering from the fatiguing school-room, but rushing to bear aloft

> The banner with the strange device "Excelsior."

These are the men and women who have the spirit which will make a country great, which have a devotion which will make a people love; and who in the just course of things will be honored with the public confidence, or at the worst die blessed martyrs for their race's good.

> Monumentum ære perennius.

The martyrs were joyful enough at Parrsboro, however. There was there the ecstatic exaltation which comes from the communion and sympathy of kindred spirits.

> It was the day of glory,
> Of sunshine and the breeze,
> When the mountain with its story
> Prattled to the rippling seas,
> And the brooklets chimed in chorus
> To the rustling of the trees.

And perhaps the memory of these days may delight us in the weary solitude which must so often settle down on the hard and thorough working student in the days and nights to come. But we must to our chronicle. The skeleton may serve to shadow forth the work of a busy, restless fortnight to those who were not present.

MONDAY, JULY 22ND.

Arrived in the pretty village of Parrsboro. The boys of the High School did honor to themselves and the town by the fine flag-pole bearing aloft the flag that for a thousand years braved the battle and the breeze, and which marked the school building where the classes met. Near by was the rink building, tastefully decorated, and bearing the motto and air of welcome. Inspector Lay and Principal Craig must have given the citizens a high character of the *personnel* of the school; for the arrangements were creditable and at no inconsiderable expense.

MONDAY EVENING.

Welcome meeting. Large rink hall crowded with citizens. Principal Craig, local Secretary, first presided, introducing Councillor Upham, who welcomed the School to Parrsboro in a well-worded address. President Eaton made an appropriate reply on behalf of the School, after which he assumed the chair and called the faculty to the platform with the citizens' committee, and introduced Principal Mackay, F.R.S.C., who delivered the inaugural address on "the Objects of the School and the Utility of the Scientific Method." At the close, short, merry and complimentary speeches were made by Revs. Gibbons, Morton, Egan and Dill. A formal invitation to an excursion on Minas Basin from the citizens of Parrsboro was given by Dr. Babbit, and an invitation from the people of Amherst, by Inspector Lay. At all the evening public meetings the proceedings were very materially enlivened by the band or a musical choir, the performance of which would do credit to many larger towns.

TUESDAY, JULY 23RD.

8 to 10 a.m., Registration.

10 a. m., Introductory lecture in Zoological room. Hints on collecting, preserving and mounting specimens (Mackay).

11 a. m., Chemistry (Prof. Coldwell). Adjoining this lecture room was the chemical laboratory fitted up with temporary tables and well supplied with apparatus from Acadia College and Parrsboro High School.

12 a. m. In Botanical room. Lecture by Miss Creighton, Principal Compton Avenue School, Halifax, on the collection, preservation and mounting of plants, and by Inspector Lay on floral structure.

Afternoon: Botanical and zoological excursion inland. An army with tin vascula and banners of insect netting. Defoliation of the Larch by *Nematus Erichsonii* was seen strikingly displayed. Many of the elder members of the school proved to be more youthful than the younger when tested by a march *a pied.* At home some laboratory work was going on.

Evening: Rink again filled to hear President Sawyer, of Acadia College, on the "Relation of the Scientific Method to Morals." At the close short speeches, complimentary and critical, were made by members of the faculty on the platform and others.

WEDNESDAY, JULY 24TH.

9 a.m. Astronomy. Prin. Cameron on an Eclipse of the Moon.

10 a. m. Botany. General classification, determination and analysis of *Epilobium*, *Calystegia*, etc.

11 a. m. Mineralogy. General Introduction (A. J. Pineo, A. B.)

12 a. m. Laboratory work in Chemistry, Zoology, Botany and Mineralogy. Lesson on the Tonic-sol-fa System by Rev. Jas. Anderson, M. A.

Afternoon: Excursions to Partridge Island and other points.

Evening: Prof. Vallance and daughters gave an exhibition of elocution and vocal music in the Rink Hall.

THURSDAY, JULY 25TH.

8 a. m. Exactly 100 took the train for Amherst.

11 a. m. Were met at Amherst station by a committee of citizens, were escorted to the fine Y. M. C. A. Hall, were received with an address of welcome by Senator Dickey, and were bountifully and luxuriously lunched.

1 p. m. Accompanied by the leading citizens were whirled in a great cavalcade of carriages into New Brunswick and on to Fort Cumberland, from one of the old ramparts of which Judge Morse, of Amherst, entranced the large company by a graphic and thrilling outline of the French occupation. Like a great embossed map the historic region lay before us while the magical finger of the Judge brought back to life the forms of a century ago from the cloud-capped *Chapeau' Dieu* on the right to the low-lying *Main au Dieu* on the left, and we were almost ready to dodge the cannon from Fort Lawrence across the creek. On motion of Dr. Allison, Superintendent of Education, and Inspector Leander Morse, M. A., a vote of thanks was enthusiastically given the eloquent Judge, and the cavalcade started for Fort Lawrence.

4 p. m. It was not the ancient fort but the modern dock which centred all attention here. The great basin where ships are to be raised from the Bay of Fundy to the great broad railway, and thence rolled into the Gulf of St. Lawrence, was already over twenty feet deep, showing the remains of vertical forests long ago submerged, and the road was under completion along its whole length. Mr. Ketchum, the enterprising and energetic engineer, described in a neat speech the working of the dock and road, which, when completed, will be the most remarkable of the kind in the world.

6 p. m. Back to Amherst to dine with our hosts.

7 p. m. Open air concert by the Band in the public square.

8 p. m. Farewell speeches in Y. M. C. A. Hall.

9 p. m. All aboard.

12 p. m. At Parrsboro.

FRIDAY, JULY 26TH.

10 a. m. Geology. Introductory lecture illustrated by a fine collection of specimens from King's College, by Professor Kennedy.

11 a. m. Botany. Cell life, the compositæ *cicuta*, *spiræa*, etc.

12 a. m. Zoology. Classification of insects and dissection of grasshopper.

Mineralogy. The use of the blow-pipe.

Afternoon: Astronomy, calculation of eclipses, etc., and laboratory work.

Evening: Finding the constellations and interesting stars in the evening sky; demonstrators: Prin. Cameron and Prof. Coldwell.

SATURDAY, JULY 27TH.

9 a. m. Mineralogy.

10 a. m. Geology.

11 a. m. 150 excursionists (School of Science with their Parrsboro hosts) on the steamboat "Acadia" left the wharf and steamed to Two Islands. Landed a company at Wasson's Bluff on the mainland, and with hammer and chisel made a fair collection of trapean minerals, analcite, natrolite, acadialite, heulandite, etc.

1 p. m. Steamer headed for Blomidon across the Bay. The citizens committee served lunch. The water without a ripple, strange to say.

2 p. m. On Amethyst Beach below the awe-inspiring cliffs of Blomidon. Amethysts, magnetite, and other minerals collected.

5 p m. On board and re-crossing to West Bay. Boarded the "Lima," a Norwegian barque. Steamed along the Bay scanning the strikingly marked stratification which served as illustrations for Professors Kennedy and Coldwell.

7 p. m. As night and the dark basaltic cliffs of Partridge Island began to loom, speeches were called for and were pleasantly responded to by Principal Calkin, of the Normal School, President Eaton, Secretary Dr. Hall, Professors Kennedy and Coldwell, and Inspectors Lay and Morse; while recitations were given by Miss Wallace and Mr. King.

Night. Arrived at the pier, and with cheers for our kind hosts and the band which supplied the music, crossed two miles of *terra firma* and were back in Parrsboro.

MONDAY, JULY 29TH.

9 a. m. Mineralogy. Analysis of Zeolites.

10 a. m. Introductory lecture on Elocution by Prof. Burwash of Mt. Allison.

11 a. m. Chemistry. Acid, Bases, the N & O series.

12 a. m. Geology. Rocks, Concretions, Ripple Marks, etc.

2 p. m. Botany. Grasses.

3 p. m. Astronomy. Eclipse of December worked out for Parrsboro by Prin. Cameron.

4 p. m. Zoology. Dissection of *Mya arenaria.* In other room, Tonic-sol-fa exercises (Anderson).

5 p. m. Physiology. Digestion and Circulation by Dr. John Stewart.

Evening: Lecture by Professor Burwash, D.Sc., on "Suggestions of Science." The usual short critical and complimentary speeches at the close.

TUESDAY, JULY 30TH.

9 a. m. Geology. Stratification, Cycles, Excursion specimens.

10 a. m. Physiology. The Nervous System.

11 a. m. Elocution. Voice Training.

12 a. m. Chemistry. Study of Salts, Ammonia.

2 p. m. Zoology. Dissection of the pigeon by class. Resumed from 4 to 6 p. m.

3 p. m. Physiology. Effects of exercise on digestion, respiration and the brain.

4 p. m. Mineralogy. Blow-pipe work with Professor Kennedy.

5 p. m. Music. Tonic-sol-fa.

9 p. m. Stereopticon views illustrating geological scenes, thrown on the screen by Professor Coldwell, and explained by Professor Kennedy.

WEDNESDAY, JULY 31ST.

Morning. Excursion by teams to Wasson's Bluff and Two Islands. Dramatic scene. Fundy's tide tried to rehearse the Red Sea's overthrow of Pharaoh and his hosts with a portion of the School, one of whom was left for the day on the island, a mile from the mainland.

2 p. m. Elocution. Elements of Vocal Expression.

3 p. m. Zoology. Dissection of the frog until 6 p. m.

4 p. m. Mineralogy. Naming of specimens collected.

Evening: Elocutionary and musical entertainment in the Rink Hall by Misses Wallace, Brown and Sawyer, of Wolfville. Liberally patronized by the School.

THURSDAY, AUGUST 1ST.

9 a. m. Elocution. Emphasis. Reading of poetry.

10 a. m. French. The Berlitz system expounded and illustrated by Prof. Maxime Ingres.

11 a. m. Botany. Ferns.

12 a. m. Music. Tonic-sol-fa.

Afternoon. The long tables of the chemical laboratory and the walls of the room bore a fine exhibition of specimens, collected, determined and mounted. The Botanical exhibits were strikingly conspicuous. Mineralogical specimens came next. The Zoological collection of special interest was not the work of a student of the school. It was kindly loaned for teaching purposes by Mrs. Huestis, a local naturalist of more than provincial fame, who encouraged the students and instructors by an example which did not fail to inspire with enthusiasm.

4 p. m. General annual meeting of the students and faculty for the discussion of any matters bearing on the school or its work. It was here that on the motion of Professor A. E. Coldwell, A.M., of Acadia College, seconded by Rev. Professor Burwash, D.Sc., of Mount Allison College, that the Science School paid a high, unanimous and unlooked for compliment to the EDUCATIONAL REVIEW. One School Inspector declined to express any opinion on the REVIEW, except that over 200 of his teachers were subscribers to it.

Evening. Meeting of Directors. Prize for home-made apparatus for the illustration of physics awarded to Mr. Gormley of the Truro Normal School. Parrsboro approved of for next year's meeting. Principal Ebenezer Mackay, B.A., of New Glasgow, elected instructor in Physics. Rev. Prof. Burwash, D.Sc., elected instructor in Physiology. Provisions made for extended courses. Professor Eaton re-elected President; Inspector Lay, Vice-President Supervisor A. McKay, Secretary; L. A. McKenna Assistant Secretary.

FRIDAY, AUGUST 2ND.

A rainy morning prevented a general excursion, as was projected, to the seashore. A number had to leave by boat or remain over to next week. Packing laboratory materials. Small excursions in the afternoon.

Evening: Farewell meeting in the Rink. Crowded house. Admirable address from David Allison, LL.D., Superintendent of Education, on the proper functions of the school and the effect of the scientific method on theories and beliefs. The president read the list of students who passed their examinations successfully. A number of farewell speeches, wise and witty, flighty and grave, followed; with formal votes of thanks. Among the speakers were President Eaton, who in his role of chairman had always an appropriate word to say; Inspector Lay, Professor Kennedy, Supervisor McKay, Rev. Dr. Burwash, Professor Coldwell, Principal E. Mackay, Rev. J. M. Robinson of Moncton, Mr. Smith of Amherst, Rev. Mr. Gibbons of Parrsboro, Rev. Jas. Anderson, and Mr. King. Not until about 11 p. m. did "God Save the Queen" seal the close of the third and most successful meeting of the Nova Scotia Science School.

The Halifax morning dailies, the *Chronicle* and *Herald*, the Amherst *Record* and *Gazette,* and the Cumberland *Leader* gave such full and excellent reports of the proceedings of the School from day to day that more than a chronicle of the events is not necessary in our pages. The most striking advance in any one section was probably the excellent laboratory arrangements for chemical work under Professor Coldwell. The botanical section under Inspector Lay and Miss Creighton probably bore off the palm for the greatest total of work done; while in the Zoological section there was the least done.

As for present use and historical purposes, the names of those whose interest in advancing the scholarship and usefulness of the teaching profession at the expense of their money and their vacation, should be known, we gladly publish the complete roll of attendance.

Roll of Attendance.

Instructors: F. H. Eaton, A. M., Normal School, (President); Principal A. H. Mackay, F.R.S.C., (Zoology); Inspector E. J. Lay, (Botany); Professor A. E. Coldwell, A. M, Acadia College, (Chemistry); Professor G. T. Kennedy, M. A., B.Sc., F.G.S., (Geology); A. J. Pineo, A. B., (Mineralogy); John Stewart, M. D, (Physiology); Principal A. Cameron, (Astronomy); Principal Ida M. Creighton, (Botany Assistant); Rev. Professor J. Burwash, D.Sc., Mt. Allison College, (Elocution).

Lecturers: Rev. James Anderson, M. A., (Music); David Allison, LL D., Superintendent of Education, Nova Scotia, (Lecture); Professor Maxime Ingres, (Berlitz System); President A. W. Sawyer, D. D., Acadia College, (Lecture).

Directors, etc.: Supervisor A. McKay, Halifax Schools; Principal J. B. Calkin, A. M., Provincial Normal School; Inspector L. Morse, A. M.; J. B. Hall, Ph.D., Normal School, (Secretary); Inglis C. Craig (Local Secretary).

Other Members: Wm. S. Calkin, B. A, New York, U S. A.; Jennie Rowan, St. John, N. B.; Mrs. D. Bowden, St. John, N. B.; Grace Murphy, St. John, N. B.; Mary A. Irwin, Baie Verte, N. B.; Anna Fillmore, Westmorland Point, N. B.; R. J. Wilson, Secretary Halifax School Board, Halifax; A. J. Mitchell, Halifax; M. H. Grierson, Halifax; J. M. Bowden, Halifax; M. C. Brims, Halifax; A. C. Saunders, Halifax; J. K. Brodie, Halifax; M. Brodie, Halifax; E. J. Willis, Halifax; S. F. Smith, Halifax; Emilie Richardson, Halifax; A M. Cunningham, Halifax; Martha Anderson, Musquodoboit Harbor, Halifax; J. A. Wilson, Halifax; Peter Fraser, Pictou; E. H. Stewart, Pictou; D. A. Mackenzie, Pictou; E. Mackay, B A, New Glasgow; R. Blackburn, Avondale; Antoinette Forbes, B. A, Little Harbor, Pictou; Emma J. Christie, Truro; Minnie D. Turner, Truro; J. W. H. King, Truro; Bessie Tupper, Truro; Florence Tupper, Truro; J. A. Upham, Truro; Jenna D. Peers, Truro; B. F. Porter, Truro; Alfretta Wadman, Five Islands, Col.; Lela M. Wilson, Five Islands, Col.; Melinda L. Faulkner, Folly Village, Col.; Lucy Spencer, Great Village, Col.; Ella Fletcher, Acadian Mines, Col; Sara Creelman, Upper Stewiacke, Col.; N. A. Burgoyne, Windsor, B. K. McLatchy, Windsor; Cassie M. Crowe, Selma, Hants; Eliza A. Elderkin, Falmouth, Hants; Annie Harvey, Newport, Hants, P. J. A. McKittrick, Kentville; Jessie E. Moran, Kentville; Alice E. Webster, Kentville; Burgess McMahon, Aylesford; Chas. E. Reid, Somerset; H. S. Shaw, Berwick; Nettie E. Thomas, Upper Canard; O. H. Cogswell, Morristown; H W. McKenna, Kingston; Isabella I. Landers, Margaretsville, Annapolis; H. F. Cogswell, Mabou, C. B.; S. A. Martell, Little Bras d'Or, C. B.; L. A. Philips, Little Glace Bay, C. B.; J. M. Longley, Guysboro; E. J. Longley, Guysboro; S. Amanda Hirtle, Lunenburg; Bessie S. Heckman, Bridgewater; Miss B P. Laird, Parrsboro, Cumberland Co; Bella Macaloney, Lizzie R. Kirkpatrick, Hester Sproul, Minnie G. Kew, Della E. Hatfield, John G. McCabe, Maggie Gillespie, Mary J. Sproul, Ethel Woton, Lilian Woton, Sara L. Sproul, Mary Jencks, Stuart Jencks, Bertha Cameron, P. Frank Gillespie, G. W. Cole, Emily P. Morton, Percy A. Holmes, J. A. Johnson, Annie Sproul, E. A. Aikman, Alice Aikman, Roland Davidson, Tidnish; Alice Pugsley, River Hebert; Eliza H. Pugsley, River Hebert; Ada A. Travis, Amherst; A D. Ross, Amherst. Over one hundred in all.

Closing of the Normal School of Nova Scotia.

PROGRAMME.

PART I. 9 A.M

Opening Exercises, by Principal Calkin and Rev. T. Cumming.

SPECIMEN LESSONS:

ASSEMBLY HALL.

1. Language Lesson,	Miss Rice
2. School Law,	Mr. McTavish
3 (*a*) Drawing,	Mr. Foote
(*b*) Modelling,	Miss Moore

ENGLISH ROOM.

1. The Canada Pacific Railway,	Miss Hunter
2. Literature,	Mr. Woodman
3. The Government of Canada,	Miss Westhaver

MATHEMATICAL ROOM.

1. Elocution,	Mr. Fales
2. Chemistry,	Mr. Ward

PART II. 10.30 A.M.

MUSIC — Nymphs of the Ocean Spray,	Choir

PRINCIPAL'S ADDRESS.

Presentation of Diplomas and Medals.

MUSIC — Solo — The Song that reached my heart,	Miss Ford

ESSAY

MUSIC — Trio — Wandering in the May-time,	Twelve Ladies

ADDRESSES.

MUSIC — Men of England,	Choir

AULD LANG SYNE.

All the exercises — musical, literary and professional — were very creditable. In his address Principal Calkin stated that the attendance was not as large as in other years. The total number enrolled was 121. The progress made by the pupils had been good. On the whole the year had been one of the most successful in the history of the institution. Diplomas of the first class had been awarded to thirty-one students, and of the second class to fifty-four pupils. To any of the pupils who had not been successful in obtaining diplomas he would say, failure need not discourage. In order that a diploma be worth anything the standard must be high.

The prize list is as follows: Governor-general's silver medal, for best essay on given subject, Miss Westhaver. Bronze medals, for best series of essays, Misses Vance and Skerry.

Excellent practical addresses were delivered by A. McN. Patterson, Rev. Dr. McCulloch, Dr. Allison, Rev. L. Cumming, and Hon. J. W. Longley, Attorney-general.

A School for the World.

Mr. Gladstone, responding to an address of welcome at the Paris exhibition a few days ago, said that the universe was indebted to the French Republic for the exhibition, which formed a veritable school for the people of the world.

A visitor realizes this. Nearly every country is represented, and, with a few exceptions, represented according to its wealth and importance. You see here the whole of France except its physical features, and you may get a tolerably complete view of these by climbing to the top of the Eiffel Tower. Every art, science and industry of France is represented, on a scale, too, that is simply wonderful. If every other country in the world were unrepresented it would be a wonderful exhibition. But many countries are so well represented that to visit the department given up to each is almost as valuable as paying a visit to that country. You see its products, hear its language spoken, gaze for hours curiously upon its people, watching their habits and seeing many engaged in their customary pursuits. China, Japan, Egypt are represented so faithfully that it is difficult to believe that you are not in an Oriental country. A street in Cairo is exactly represented, where Arabs, Egyptains, Turks and every known nationality congregate in the evenings.

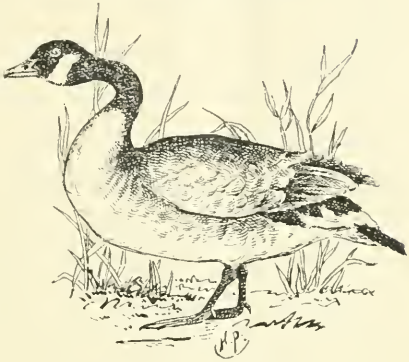
Germany alone of the countries of Europe is unrepresented, or almost so; and France is making a grand effort to surpass her warlike antagonist in peaceful pursuits.

We aim, we hope, we strive, and then we fail,—
When, lo! the way to win we clearly see;
Why should we, then, our overthrow bewail?
Defeat gives us the key to victory!
When comes another chance, to-day, next year,
Shall we, successful, count experience dear?

Emma C. Dowd.

FERNDALE SCHOOL.

No. XXV.—The Canada Goose.



Branta Canadensis (Linn.) A. O. U., 172.
From specimen in Provincial Museum, Halifax, N. S.

An omen in March.
A V-line of *Branta* is seen on the wing
In heaven's high arch.
It is *mene* and *tekel* for winter's great king.
His castle walls crumble and tumble and cling,
And borne on wide freshets acknowledge the spring;
Then swelter and parch.

Ere November is old
The omen retreating is seen in the sky,
For the ice-king is bold.
'Tis the Canada goose coming back on the fly;
And the whimpering winds rush along with a sigh
O'er the scampering leaves, ere they lay down to die;
For the ice-king is coming, enthroned on high—
The ice-king so cold.

— Kymah — *Branta Canadensis.*

T. See who will make the best sketch of our Canada Goose. We should always try to draw, and we would then soon surprise ourselves with what our hand can do.

S. I don't think we could ever draw so well as that sketch on the board.

T. That is just what the person who drew the sketch said not very long ago. But tell me where you have seen a Canada Goose.

S. High up in the sky. They fly in a line sometimes straight, sometimes crooked, often in a V-shape.

T. Did you see any lately?

S. No.

Jack. We may see some this month, September. They begin to come back from the north, where they have been spending the summer.

T. Very good, Jack; you have been watching them. When may they be found in our country, do you know?

JACK. In April and October. They pass over the country, going north, from March to the first of May generally, and return from the end of September to November.

T. Do they always move at exactly the same time each year?

JACK. No. Sometimes earlier and sometimes later.

T. Why, I wonder? What reason can you give for it?

S. If it is an early spring they move earlier, and if it is a late fall they may stay longer.

ANOTHER S. They appear to like as cold weather as they can get, without its being so cold as to freeze up the water in which they get their food.

T. Very good. There must be some reason for the particular time of their movement. So let us watch very carefully, as Jack has been doing, when they first appear, going north or south, and when the last are seen moving. We will then give our information to the ornithologists, who are wanting to get as much information as they can about the migration of birds, so that they may know exactly why they do move at particular times.

S. Is it found in any other country when they call it the Canada Goose?

T. Oh, yes. It winters in the United States. And over two hundred years ago it was taken to Europe, and has increased there so favorably that it is put down in the lists among the European birds.

T. Notice the webbing of its black feet.

S. All the toes are connected with webs except the hind one.

T. Then it does not belong to the "full-webtoed" (toti-palmate) birds. Has it tube-shaped nostrils?

S. No. It is not one of the "tube-nosed swimmers." It belongs to the "lamel-billed swimmers." You can see the line teeth-like lamels on the upper half of the bill near the angle quite plainly.

T. Correct. How many different "lamel-billed swimmers" are there in the Atlantic Provinces?

S. Thirty-five species, you told us. But how can we know which this one is?

T. There are eighteen genera; and of these there is only one genus which has the neck as long or longer than the body — the swan genus.

S. Then we have to search among seventeen genera?

T. Yes. But of these, fifteen have the *tarsus* or shank *shorter* than the middle toe without the claw, and two have the tarsus *longer* than the middle toe without the claw.

S. Our specimen, then, must belong to the last group.

T. Then it belongs to the genus, *Chen* or *Branta*. *Chen* has the lamel-teeth visible all along the edge of the upper half of the bill, which is very stout; and it has a white head and neck.

S. This is *Branta*, then.

T. Correct. And there are only *two* species of *branta* in our provinces, *Branta Canadensis*, the Canada Goose; and *Branta Bernicla*, called in English, Brant. One of these has a head completely black; the other has a black head with a white patch on each cheek, usually meeting on the throat.

S. The Canada Goose is *Branta Canadensis*, then, because it has the white on its head.

JACK. We know nearly as much about the Brant now as about the Canada Goose.

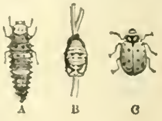
T. Yes. You might know it if you saw it. The white patch is on the sides of the middle of its neck. It is only about two and one-half feet long, while the Canada Goose is about three and one-half feet sometimes. Its eggs are about three inches by two, while that of the goose is about three and one-half by two and one-quarter. Brant also breed farther north than the Canada Goose.

"Lady Bird" Beetles.

Bête à bon Dieu, the French children delight to call it;

"Lady bird, lady bird,
Fly away home,"

English children sing to it. Perhaps there are over 1,000 species of them in the world, and those of them we know are the true friends of man. Here is a cut of a species not common here (*Hippodamia Convergens*), but it is at hand, and illustrates well the general form of the larval (A), pupal (B) and perfect (C) stages of their life history. The larva is very active and destructive to plant lice especially. This summer they have saved threatened crops in Ohio and other States when the puny power of man could avail nothing against rapidly multiplying grain-aphis.



LADY BIRD BEETLES.

The general shape of lady-birds when at rest may be compared to a split pea, the elytra or wing covers being very hard and convex. Their flying wings are neatly tucked in beneath. Some species are very gaudy, being ornamented with red, white, black and orange colors, arranged in spots or bands. They walk slowly. Sometimes when disturbed they draw in their short feet and feign death; sometimes they open up their wing covers and fly off. When handled, they often give off an offensive fluid from the joints of their body, which has a very strong and pungent odor, one means of defence. They lay their eggs generally in or near a colony of plant lice, so that as soon as the larvæ become hatched they commence devouring the insects. We have often watched the larvæ capture and destroy numbers of the *aphis* on green oats.

An amusing story is told of a gentleman whose rose bushes were grievously infested by plant lice. He took the greatest pains going over them every morning and destroying the *old ones*; yet his bushes were ten times as badly injured by the lice as those of his neighbor, who paid no attention to them. It turned out that the old gentleman was killing off the lady bird larvæ, which were only hunting on his rose bushes, under the impression that they were the mothers of the plant lice. In other words, he was killing his friends while sparing his enemies. And no wonder the plant lice increased under his careful protection of them. And thousands of people are doing the same thing every day, because they do not know better. Every school should have an oral lesson on the friendly "lady birds," given to them each year.

A few of the common species can be recognized from the following brief marks:

The *nine spotted lady bird*, nearly round, of a brick-red color, and with nine black spots on the wing covers. The *plain lady bird*, brick-red with no markings on its elytra. *Spotted lady bird*, pinkish colored, with twelve large black spots. *Thirteen dotted lady bird*, thirteen black spots on a brick-red ground. The *convergent lady bird*, of a deep orange red, marked with black and white. The *double-dabbed lady bird*, black, with two yellow spots; and the *two spotted lady bird*, found clearing the hop plant of the lice infesting it, as mentioned in our Question Department; which suggested this notice.

Astronomical Notes.

The Sun will "cross the line" on Sunday, Sept. 22nd. It will take him all day and more to do it. He will begin work at it about half an hour after midnight on Saturday, keep at it all through the Christian Sabbath, and finish the job at ten minutes past nine on Monday morning. His centre will be on the celestial equator at a quarter to five on Sunday afternoon — just 186½ days after it was there last March, and 178¾ days before it will be there again next March; for the Sun stays in the Northern Hemisphere about eight days longer than in the Southern.

Astronomical text-books are in the habit of saying that on September 22nd, day and night are equal, twelve hours each, and that this is so everywhere. Have any of you ever tested this by observation? Perhaps some of you will do so this September and send in the result. Note as accurately as possible when the Sun begins to appear above the horizon and when it disappears below it. With a sea-horizon, and a station at sea-level, and a mean state of temperature and air-pressure, and a clear morning and evening, (see below for an inducement to get up and make the morning observation) and a fairly regular watch, the day will be found in our latitude to be about twenty minutes longer than the night. In higher latitudes the difference is greater, and at both the poles there will be no night at all — as the Sun will be above the horizon through the whole twenty-four hours.

The evening star for the month is Jupiter. The Moon will occult him on the morning of Oct. 1. The occultation will be best seen in the west of China.

Mercury and Mars are also evening stars, but Mars is now quite beyond the range of the star-gazer's eye, and hard to find even with a field-glass; and Mercury never amounts to very much as our *evening star in autumn*, because — but I won't spoil your sport — think it out for yourselves.

Early risers will come in for many of the best parts of the astronomical programme for the month. Venus, Mars and Saturn are morning stars. On the morning of the equinox day — Sept. 22nd — all three of them, and the then crescent of the waning moon also, will be closer together in the western end of Leo — so close that a circle of five degrees diameter will include them all, and include with them the first magnitude star in the handle of the Sickle—Regulus. This will be a very pretty sight well worth the trouble of turning out an hour or two before sunrise.

Saturn will be quite near Regulus all the month, nearest on the 20th. On the morning of this day Mars will also be at his nearest to Regulus, and so near to Saturn at the same time that to the naked eye the two planets will look like one. Venus will pass Regulus on the 25th, less than a moon-breadth above him. Next morning she will be a little more than a moon-breadth below Saturn, and on the morning of Oct. 1st she will be about the same distance below Mars. This little family gathering of the planets in the neighborhood of Regulus will be one of the most interesting events of the year to the star-gazer. It is a pity it couldn't come off in the evening.

Have you ever seen *Mira?* If not you may this month. But perhaps you have forgotten who *Mira* is. "*Mira*" means "wonderful." The star of that name is in the constellation of the Whale—Omicron *Ceti*. The wonderful thing about her is that for about eight months out of eleven she is invisible to the naked eye; and during the other three months she increases from bare visibility up to sometimes second magnitude, sometimes only 3rd and sometimes not more than 4th, and then fades again out of sight. Thus she is a variable star and one of the three most remarkable of that class. She is not regular in her variations and so it is not possible to predict exactly the times of her maximum brightness. A French astronomical periodical (*L'Astronomie*), gives August 6th as the date of her maximum this year. As a general rule she is visible for a couple of months after May. If, then, the Frenchman's date is correct, *Mira* should be visible until the first week in October. But you had better look her up the first fine night. Take your star-map and note how she lies with respect to Alpha, Gamma and Delta *Ceti* and Alpha *Piscium*—in line with Alpha and Delta *Ceti*, Delta to *Mira* being rather less than the distance from Alpha to Delta; also a right angle formed at *Mira* with Delta *Ceti* and Alpha *Piscium*. These two tests are more than sufficient. Now go out the first fine evening, between eleven and twelve, and face between east and south-east. Pick out these stars, apply these two tests, and enjoy your first sight of the wonderful one. Compare her brightness with that of the stars nearest by. (On August 22nd she was brighter than Delta *Ceti*). After your first glimpse of her, watch her every clear night as long as she remains visible; note the date of her disappearance and send it to the the Review, and then don't bother about her any more for eight months.

Algol is another variable star but of a very different type. This month we shall leave our readers to make their own discoveries of his variations—by comparing him with the star near. Next month we may give a few of his more favorable minima data.

Scientific News.

The New Bark-louse in Cumberland.—Last summer a new species of the Bark-louse genus, *Rhizococcus*, has been found in great numbers on the stems and leaves of grasses in two widely-separated communities, Cumberland County, in Nova Scotia, and Custer County, in Dakota. They are not known to be injurious, otherwise their conspicuous abundance in both localities would be cause for alarm. The Rhizococcus is found as white sacs attached to spears of grass and are filled with eggs. These sacs are of waxy material secreted by the wingless females all over their bodies as the time for depositing their eggs arrives. As the eggs accumulate, the body of the insect is crowded forward in the white waxy case which is adherent to the grass, and finally shrivels up in death in the front portion. What remains is simply a nest of eggs, which in due season are hatched into life, if nothing untoward occurs. In the Cumberland specimens, which were collected by Inspector E. J. Lay, we found in a few days a number of minute parasitic flies coming out of the cases after having destroyed a number of the eggs. These parasites will probably prevent the unlimited reproduction of the Rhizococcus in these provinces. On the authority of the Dominion Entomologist, at Ottawa, Mr. Fletcher, and the U. S. Entomologists, at Washington, Riley and Howard, the species of *Rhizococcus* is new; and the parasite fly, found in the Cumberland specimens, belongs to the genus *Leucopsis*. Seven years previously Inspector Lay was the first to report the advent of the Colorado Potato Beetle in Nova Scotia.

The Larch Saw-Fly.—The appearance of this insect, *Nematus Erichsonii*, in Nova Scotia, was, we believe, first noted in the Review of last September from one of our western counties. This summer they have been noticed completely defoliating the Larch (*Larix Americana*) in the Annapolis Valley and in Cumberland County. They have not yet apparently crossed the line of railway between Pictou and Halifax. In 1880 it was first noticed in the vicinity of Boston; in 1882, in Quebec; later in Maine and then in New Brunswick; and in 1888, in Nova Scotia. Next summer, 1890, it will probably be noticed in the larch forests of Central Nova Scotia. Mr. Fletcher, the Dominion Entomologist, expresses the hope that in many cases the defoliated trees may not be destroyed, as the early disappearance of the larvæ gives time for the trees to put forth sufficient new leaves to maintain life; and in two or three years, probably from the increase of their parasites, the insects have been generally found to diminish. He says, "Swamps and groves in which every needle was taken off the Tamaracs are now green again in this district. I trust this is the case in other localities. Please let me know how it is in your district." Will not our many intelligent readers in the districts affected make the observation, with care to be accurate? The perfect insect is a four-winged fly, not very unlike the two-winged house-fly at a distance. The larva is a small naked caterpillar, looking much like its near relative—the larva of the currant saw-fly. An illustrated sketch of it again.

Slide up thy silver sands, O booming sea,
The pines that skirt thee catch thy minstrelsy,
And over all the forest swells a tone
That echoes but the music of thine own.

Helen L. Carey.

BOOK REVIEWS.

Gray's "How Plants Grow," with an appendix containing the School Fern Flora of Canada. (Descriptions of all the native ferns of the Dominion, with localities where they grow.) By George Lawson, Ph.D., LL.D., F.I.C., F.R.S.C., McLeod Professor of Chemistry, Dalhousie University. Halifax, N. S.: A. & W. Mackinlay, Publishers. Here we have the well-known text-book of our schools, supplemented by over thirty pages on the Ferns of Canada, with a plate illustrating the fruit structure on which the classification of seventeen genera are based. No man could be more competent for such work than Professor Lawson. It is now exactly a quarter of a century since he published a synopsis of the "Ferns and Filicoid Plants of Canada" in the Canadian Naturalist. Then after deducting the number of species not certainly known to exist in Canada there were found to be *sixty-three* Canadian species. The careful surveys of Macoun, Burgess, and others since, which are all embodied in the present work, bring the list up to sixty-five, with perhaps nine or ten varieties. They are grouped into twenty-five (25) genera. The teachers of Canada should now be careful to see that they get "How Plants Grow" with the *Canadian Ferns.* No division of our flora is more interesting or more easily mastered.

A Guide to the Study of Nineteenth Century Authors, by Louisa Manning Hodgkins, Professor of English Literature in Wellesley College. D. C. Heath & Co., Boston, New York and Chicago. This is an outline for the use of students of nineteenth century literature, presenting a list of the principal authors, with leading biographical notes, contemporary writings, references to the principal works of each, and other information leading to a complete and exhaustive study of the subject.

Two Great Retreats. Published by Ginn & Co., Boston. This is another work in that excellent series—Classics for Children—which Ginn & Co. of Boston lately began so successfully in "Tom Brown's School Days." The two retreats are—that of the Ten Thousand, from Grote's account, and an abridgement of Count Segur's narrative of Napoleon's Retreat from Moscow. Both are of extraordinary interest, to old as well as young, and the excellent print of the volume before us, with explanatory foot-notes and maps, gives it a great additional value.

The Irregular Verbs of Attic Prose; their Forms, Prominent Meanings, and Important Compounds, etc. By Addison Hogue, Professor of Greek in the University of Mississippi. Ginn & Co., publishers, Boston. The material treated in this book is here much fuller than in the lists of irregular verbs in the grammars, and much more accessible than in the lexicons. It contains after the regular verbs,—pure, mute, and liquid,—the Irregular Verbs of Attic Prose in alphabetical order. Prominent meanings and special uses of frequent occurrence are given, often illustrated by translated examples. The most important compounds are added, and also many related words,—forming a very practical sort of introduction to word-formation.

Ridgway's Manual of North American Birds, illustrated by 464 outline drawings of the generic characters. Philadelphia: J. B. Lippincott Company, 1887. Cloth, gilt, $7.50. This is a fine, large, royal octavo volume of some 650 pages and 124 full-page plates of drawings. The classification, numeration and nomenclature conform with the recommendations of the American Ornithologists' Union. The whole work is analytically arranged, so that the veriest beginner with a strange specimen in his hand and a knowledge of ornithological terms in his head would have no difficulty in determining the species nearly as fast as he could turn the few pages in which the *key-points* of structure are so orderly and conspicuously to be found. It is the *leading* authority at the present day on our American birds, we would say. There is scarcely an unnecessary word or sentence in the whole volume—conciseness as well as order being its great characteristic. No one should be more competent to produce a standard work on the subject than Dr. Ridgway. For twenty years he devoted himself exclusively to ornithology, and is well posted in the birds of the old world as well as in those of the new. In the National Museum of the United States he had access to nearly 60,000 specimens which he thoroughly overhauled. There are 1,028 species described in this volume, so that the student may be quite sure that he will find no bird in his district not described in this volume. The form of the printed matter on the page made great demands upon the skill of the printer. The typography, therefore, reflects much credit on those having charge of that department.

Ear and Voice Training, by means of Elementary Sounds of Language, by N. A. Calkins. New York and Chicago: E. L. Kellogg & Co., 1889. This small volume of 80 pages is No. 10 of "The Reading Circle Library," and is a valuable book for all who have to do with the training of children. It gives very explicit directions to the teacher, so that he who reads can drill.

Elementary Chemical Technics, a handbook of manipulation and experimentation for teachers of limited experience, and in schools where chemistry must be taught with limited appliances. By George N. Cross, principal of the Robinson Female Seminary. Boston: Silver, Rogers & Co., publishers, Eastern Educational Bureau, 1889. A neat volume of 117 pages, simple, concise, and just what it professes to be. Contents: Chapter 1, Construction and Equipment of Laboratories; 2, Glass Working; 3, Construction of Apparatus; 4, General Manipulation; 5, Experiments with HO, H_2O and Air; 6, Exp. with N. Compounds; 7 Fl, Cl, Br, I, and their compounds; 8, C and its compounds; 9, S, P, As, Sb, B, Si, and their compounds; 10, Experimentation with metals and their compounds; 11, Spectrum Analysis; 12, Electricity in Chemical Reactions.

A Reader in Botany. Part I. From Seed to Leaf. By Jane H Newell. Ginn & Co., publishers, Boston. This book, which follows after the "Outlines of Lessons in Botany," by the same author, is well calculated to awaken the interest of students in the life and habits of plants. Among the subjects treated are, "Origin of Cultivated Plants," "The Cotton Plant," "Climbing Plants," "Uses of Forests," "Insectivorous Plants," and many others.

Henry the Seventh. By James Gairdner. London: MacMillan & Co., and New York. This is another volume in the Twelve English Statesmen Series, and it is not behind any of its predecessors in interest and the importance of the subject treated. The chapter on Ireland and Henry's policy regarding it is very instructive reading at the present time.

Johnson's Canadian School Shorthand, for self instruction. Any one can learn it. A complete exposition of the art. No further assistance necessary. As plain as print to read. As rapid as speech to write. Can be learned in a few weeks. May be written heavy or light. So says the author, G. W. Johnson, Headmaster Central School, Hamilton, Ont. 1889. Price, 25 cents. $5\frac{1}{2}$ inches square, 73 pages, in script, lithographed.

Entomology for Beginners, for the use of Young Folks, Fruit Growers, Farmers and Gardeners, by A. S. Packard, M. D. New York: Henry Holt & Co., 8vo., pp. 367. The best book we have yet seen for the use of beginners who have not the taste or cannot afford to buy expensive volumes. It has been recommended, we understand, for junior work in entomology in the Nova Scotian Summer School of Science.

Homer's Iliad. The first three books of, with introduction, commentary, and vocabulary, for the use of schools, by Thomas D. Seymour, Hillhouse Professor of Greek in Yale College. Boston, U. S. A.: Ginn & Company, 1889. $1.35. This is a well bound, beautifully printed and thoroughly complete classical text book. The author's name is a sufficient guarantee of the scholarship. A student's glance through it will impress him with the valuable nature of the aids brought together within easy compass to enable him thoroughly to master his subject.

An Elementary Class Book of General Geography by Hugh Robert Mill, D.Sc., F.R.S.C., lecturer on Physiography and on Commercial Geography in the Heriot Watt College, Edinburgh. London: MacMillan & Co., and New York. 1889. A neat volume of nearly 400 pages. It is not an atlas, nor does it contain any maps. The maps should be on the school-room walls, and the lessons explained on them before being assigned to the pupils. While the book is a valuable compendium of geographical knowledge, we do not think it can be favorably compared with our own for school purposes.

Autobiography of Frœbel, translated and annotated by Emilie Michaelis, Head Mistress of the Croydon Kindergarten and Preparatory School, and H. Keatley Moore, Mus. Bac., B. A., examiner in music to the Frœbel Society, etc. 167 pages. Syracuse, N. Y., U. S. A.: C. W. Bardeen, publisher, 1889. $1.50. Just the kind of book you would expect; interesting to all, but specially valuable to teachers. The little volume is a good specimen of typographical work.

The Beginner's Book in German with humorous illustrations by Sophie Doriot, author of "Beginner's Book in French." Boston, Mass., U. S. A.: Ginn & Company. $0.90. 273 pages of exercises. In beautiful, large, clear type, just the size to bring out the beauty of the German letter. The exercises are well graded, and we scarcely think German could be more pleasantly presented to the beginner.

One Year Course in German. Adapted to the wants of students in preparatory and High Schools fitting for the leading Colleges. By Oscar Faulhaber, Ph. D., Professor of Modern Languages in Phillips Exeter Academy. Second edition. Boston, U. S. A.: D. C. Heath & Co. 1888. About 200 pages with vocabulary and of good size for our High Schools or Academies—that is, it has about the proper amount of German to be mastered in connection with our prescribed High School Course in one year. It certainly appears to be a good text book.

Practical Latin Composition. By William C. Collor, A. M., Headmaster Roxbury Latin School. Boston, U. S. A., and London: Ginn & Company, 1889. The motto of this book is "The true test of a practical mastery of Latin is the power to write Latin." Ascham's principles of Latin teaching are emphasized. The first and greater part of the book, 140 pages, is taken up with exercises to be translated into Latin, the sentences being based on fifty pages of Latin near the end of the book. The first section is on the seven Kings of Rome; the second extracts from Nepos; the third from Cæsar, and the fourth from Cicero. The Latin should be originally read and explained. The translation should then be attempted to be framed on the model of the Latin text. There is a vocabulary at the end. The plan, we think, is based on sound principles; and is one which would add much more interest to the exercise of Latin composition, while the aid given by the presence of the more complex original would be natural, healthy and inspiring—the scientific method.

Die Braune Erica, Novelle von Wilhelm Teufeu, with English notes by E. S. Joynes, Professor of Modern Languages in the University of South Carolina. Boston, U. S. A., D. C. Heath & Co., 1889. The "Violet Heath" is a pretty and instructive story of sixty-eight pages, just what is wanted for the student who commences to read German.

La Belle-Nivernaise, the story of a River Barge and its crew by Alphonse Daudet. Edited with introduction and notes by James Boielle, B.A., Senior French master in Dulwich College, with six illustrations. Boston: D. C. Heath & Co.; 1889. A capital story for the tyro French reader, in less than 100 pages.

Science Teaching in the Schools; an address before the American Society of Naturalists by William North Rice, Professor of Geology in Wesleyan University, with appendices. Boston: D. C. Heath & Co.; 1889. One of the "monographs on education"—a good paper of some thirty odd pages.

A Primer. By Anna B. Badlam, Rice Training School, Boston, Mass. Boston: D. C. Heath & Co.; 1889. 123 pages, large type, good paper, pictures, and hair lines and diacritical marks to mark the different powers of the letters. An approach to a phonetic alphabet, while retaining the old forms.

Round the World with the Poets. Selected and arranged by Mary Cate Smith, formerly assistant in the Plymouth, N. H., Normal School, and Principal of Training Department, Normal School, Milwaukee, Wis., and Sarah C. Winn, first assistant in the Gaston School, Boston, Mass. The selections comprised in this little book afford a pleasing, as well as practical, series of review exercises in the study of geography. The quotations are arranged in the natural order of the study—beginning with physical features, and followed by longer poems relating to particular countries, mountains, rivers, cities, etc. 100 pp., bound in cloth, 12mo. Price, Twenty five cents, postpaid. Charles H. Kilborn, publisher, 3 Tremont Place, Boston.

Onkel und Nichte, a German story for sight translation by Oscar Faulhaber, Ph. D., Teacher of Modern Languages in Phillips Exeter Academy. Boston: D. C. Heath & Co.; 1889. A 64 page simple German story suitable for schools. Pictures of various phases of German life.

ARITHMETICAL REVIEWS. By J. L. Patterson, D. Sc., Mathematical Master in the Lawrenceville School. Boston, U. S. A., Ginn & Co.; 1889. Twenty-four pages of arithmetical exercises suitable for reviews.

SIR THOMAS WYATT AND HIS POEMS. By Wm. Edward Simonds. This beautiful volume, from the press of D. C. Heath & Co., Boston, comprises an introduction, a biography of Wyatt, and a close and comprehensive review of his poems.

RECEIVED.

ENDOWMENTS, an address before the College Association of Pennsylvania, J. G. Fitch, M A., LL D

REPORT of the Ornithologist and Mamologist, U. S. A., (C. Hart Merriam, M. D) for 1888.

A TABLE of the Cubical Expansion of Solids, by Prof J. G. MacGregor, D Sc , F R S C. and E , of the University of Dalhousie, Halifax.

AIDS FOR TEACHING GENERAL HISTORY, including a list of books recommended for a working school library, by Mary D. Sheldon, formerly professor of history in Wellesley College, etc. Boston, New York and Chicago: D C Heath & Co , 1888.

ON CARNOT'S CYCLE IN THERMODYNAMICS, by Prof J. G MacGregor, University of Dalhousie.

THE ENGLISH SPARROW in North America. Bulletin 1. U. S. A. Department of Agriculture.

PUBLICATIONS RECEIVED.

The *American Geologist*, Minneapolis, U. S. A , for July, has the following on its list of able articles: "Studies in the Indiana Natural Gas Field," by Frank Leverett; "Meteorites and what they teach us," by H. Hensoldt; "The General Interior Condition of the Earth," Joseph Le Conte; "The late Session of the International Congress of Geologists at London," Persifer Fraser, Sr.....*Science*, New York, comes weekly each one as good as the preceding..... The *Microscope*, Detroit, U. S A., sustains its usual interest. ....The *Maritime Medical News* does credit to the medical profession of the Atlantic provinces....The *Popular Science Monthly* is the most popular monthly we know of Its science is never exhibited in the abstruse phase. ....The Halifax *Carnival Mail* was a very creditable production from both the artistic and literary points of view. Our young artist, Mr. Harry Piers, was the author of the short article on Nova Scotian Birds which graced its pages.....The St. John's (Nfld.) daily *Mercury* deserves special credit among the leading American papers for the scientific as well as literary ability displayed in its editorial columns A very large proportion of its leaders are of more than local or ephemeral interest. For instance its articles lately on the fisheries, fish-hatching the natural history of the island, etc ....The *Forum* for September enters its eighth volume, and its publishers announce that its subscribers at the beginning of the eighth volume are fifty per cent more than they were at the beginning of the sixth volume, one year ago. This is proof that the kind of articles which the *Forum* presents—discussions of important present problems by the best writers that it can employ—finds an increasing number of readers ....The *Century* magazine for September contains several valuable unpublished letters by British officers of Napoleon in exile, and a finely illustrated article on "Winged Botanists".... *St. Nicholas* for September contains many interesting and instructive articles, among which are "Modern Harbor Defenses," "Among he Florida Keys," "Story of Turk" (a St. Bernard dog) and others ... *Wide Awake* for September is a beautifully illustrated and readable number.... *Garden and Forest*, New York, is publishing among other interesting matter, "Notes upon North American Trees"....Among other periodicals received and to which only a reference can be made in this number are the *Scientific American*, *Herald of Health*, *The Bookmart*, *N. Y. School Journal*, Toronto *Educational Journal*, *Treasure Trove*.

Saint John County Teachers' Institute will be held at Saint Martins on the 19th and 20th inst.

PROGRAMME:

(*a*) Thursday, 10 a. m.—Enrolment, etc.
(*b*) " 2.30 p. m.—Specimen lesson in modelling, by Miss G Orr.
Cures for Tardiness by F. H. Hayes, Esq.
Thursday evening.—Public Educational Meeting.
(*a*) Friday, 9 a m —How to Influence the General Reading of Pupils—Edward Manning, Esq.
(*b*) Friday.—"How to obtain Accuracy and Rapidity in Primary Arithmetic —By M D. Brown, Esq
Friday, 2 30 p. m —Question Box and routine work.

Teachers attending the Institute can secure an ordinary first-class ticket at St John, Hampton, or intermediate points, entitling them to return free on presentation of certificate from Secretary of Institute.

WM. SIMPSON,
Secretary.

G. U. HAY,
President.

Programme of Charlotte County Teachers' Institute to be held in St. George, Sept. 26th and 27th, 1889.

FIRST SESSION, 10 A. M —Routine. Enrolment of members Election of officers, etc.

SECOND SESSION, 2 P M.—Paper, Temperance teaching in our schools, Mr J Phillips Adams Discussion opened by Mr. A. H Sherwood Paper, Geometry, Mr. J. Walker Moore Discussion, Mr. Frederic O Sullivan

THIRD SESSION, 8 P. M.—Public meeting, Lynott's Hall Addresses by the Chief Superintendent of Education, Inspector Carter and others

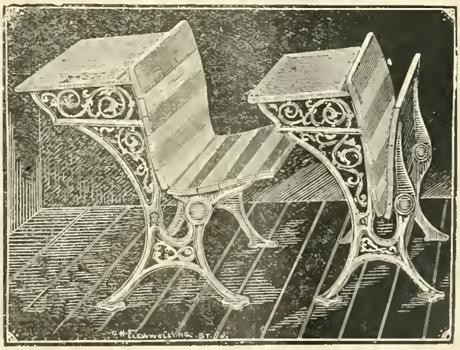
FOURTH SESSION, 9 A M —Paper, Reading in Primary Grades, Miss Lyle Discussion. Miss Howard. Paper, Moral Teaching in the School, Miss Richardson. Discussion, Mr P G. McFarlane.

FIFTH SESSION, 2 P M.—Paper, Plant Life, Mr J Vroom. Discussion. Miss Dibblee. This paper will be followed by an illustrative lesson. Determining time and place of next meeting.

Certificates of free return fares will be issued to those who enrol themselves members of the Institute.

GEO M. JOHNSTON,
Secretary-Treasurer,

WM. BRODIE,
President.



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The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

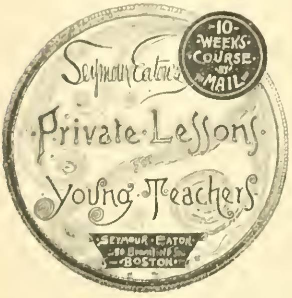
FACULTY OF ARTS—(Opening Sept. 16th, 1889).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 16th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

(Address McGill College.)

J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.



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The Educational Review.

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PUBLISHED MONTHLY. ST. JOHN, N. B., OCTOBER, 1889. VOL. III. No. 5

A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
G. U. HAY, Ph. B., Editor for New Brunswick.

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

AFTER the 1st of November the Nova Scotian headquarters of the EDUCATIONAL REVIEW will have been transferred from Pictou to Halifax.

AT a recent meeting in the kindergarten room in Truro a Mother's Circle was formed, the object of which is to bring about a closer sympathy and cooperation between the family and the kindergarten. Mrs. Condon presided and explained the object of the meeting and was followed by Miss Twichell, Principal of the Truro Kindergarten, whose interesting address was listened to with great attention.

WE are glad to learn that Mr. W. F. Ganong, of Harvard, is about to publish a work on the Economic Mollusca of the Atlantic Provinces. From proof-sheets which we have seen, we can recommend it to every teacher and every family on the long coast line of our three provinces. He gives figures which will enable any one to identify the common and useful shell-fish in the waters around us; and shows to what extent they have been used as food, or for the benefit of man. The book is extremely popular and will be a revelation to the multitude.

THE Nova Scotia Normal School, at Truro, will open on the 6th November. The Tonic Sol-fa system of music will be taught in it, we observe, as will also the kindergarten system.

LECTURES began at the N. B. University this week. There were fourteen students who matriculated for the full course, four of whom are young ladies. The leader of the Freshman class and winner of the Wilmot scholarship is Mr. Harry Porter, of Fredericton, closely followed by Miss Frances Everett.

WE are in the midst of the season of local educational institutes. Brief outlines of the proceedings at some of these conventions will be found in another column. So far as we have been able to gather from published reports and from persons attending them the proceedings were of great practical importance to the teachers assembled. This could not be otherwise when all classes of educational workers from the superintendent to the primary teachers meet at these conventions. Every phase of work may be examined and commented upon, difficulties solved, differences of method compared and the best methods emphasized. We do not see how it is possible for teachers to attend these institutes and not receive and confer great practical benefits.

SEVERAL New Brunswick teachers attended the Science School at Parrsboro, N. S., last summer. Dr. Burwash, a New Brunswick professor, has been appointed to the staff of instructors for next year. Parrsboro, the place of meeting next summer, is rather central. Would not a more complete union of Nova Scotia, New Brunswick and Prince Edward Island in a Summer School of Science be desirable? We don't know, but we moot the question.

WE invite the attention of our readers to the articles on Modelling in Clay which are to be found in this number. A careful perusal will be of benefit to those who have just begun this work in their schools.

SUBSCRIBERS in arrears to the REVIEW will confer a favor by remitting before the first of November.

LOCAL EDUCATIONAL INSTITUTES.

Since our last number was published teachers' institutes have been held in St. John, Charlotte, Gloucester, Kings, Northumberland, Kent and Albert Counties, in New Brunswick. These institutes have been well attended, the papers and discussions, so far as can be gathered from the reports, were stimulating and helpful, and excellent practical results in the schools should follow. At nearly all the institutes public educational meetings were held. The Superintendent of Education was present at most of the gatherings and gave instructive addresses. The district inspectors by their presence and co-operation rendered good service to the teachers assembled.

St. John County.

Over 150 teachers were enrolled at this Institute, which met in the hall of the Victoria School, St. John, on Thursday and Friday, Sept. 19th and 20th. Miss Orr's illustrative lesson on Modelling in Clay was an excellent feature of the proceedings. With a class of about a dozen from her kindergarten school she showed how pleasure and instruction could be combined. While moulding the sphere and cube teacher and pupil worked, talked and sung in unison, every word and motion being directed to the work in hand. Superintendent Hayes' address on Tardiness provoked considerable discussion. Points of agreement in dealing with tardy pupils were suggested which it is hoped may become general. Our readers will find the subject discussed elsewhere. Edward Manning, M. A., of the Grammar School, read a paper on How to Influence the General Reading of Pupils. The paper was a very complete and admirable summing up of the factors that should enter into this important subject, and Mr. Manning, it is hoped, will give the readers of the Review the results of his experience and wide reading. Mr. M. D. Brown opened a discussion on "How to Obtain Accuracy and Rapidity in Primary Arithmetic" by giving some excellent ideas on the best method of teaching it. The public meeting on Thursday evening was presided over by Senator Boyd, Chairman of the St. John Board of School Trustees. Addresses were delivered by Chief Supt. Crocket, G. U. Hay and John March.

Charlotte County.

There were over fifty teachers in attendance at this Institute, which was held at St. George on Thursday and Friday, Sept. 26th and 27th. Papers were read by Mr. Walker Moore on Geometry; by Miss Richardson on Moral Teaching, by the president, Mr. J. Vroom, on Plant Life, by Miss Lyle on Teaching Reading in Primary Grades, and by Mr. Adams on Temperance Teaching in our Schools. A public educational meeting was held on Thursday evening at which addresses were delivered by Supt. Crocket, Inspector Carter, A. H. Gilmour, M. P., Rev. Mr. Pineo, Mr. Hibbard, M. P. P., and Mr. Charles Johnston, Secretary of School Trustees. During Thursday afternoon the members of the Institute visited places of interest about St. George.

Gloucester County.

The Gloucester County Teachers' Institute met in Petit Rocher, Thursday, Sept. 26, with an attendance of nearly sixty. Inspector Mersereau was chosen president, ex-Inspector Boudreau vice-president, Mr. J. E. Lanteigne secretary, and Miss Meahan and Mr. Jos. Comeau additional members of committee of management. Instructive papers were read, and an interesting public meeting held on Thursday evening. Among the subjects discussed at this Institute were portions of Rousseau's Emile and Payne's Lectures on Education, and it was resolved that a sum of money not exceeding ten dollars be appropriated from the funds of the Institute for prizes to teachers residing in the county, and holding licenses not in advance of second class, for the best three essays on the third chapter of "Payne's Science and Art of Education."

Kings County.

The Kings County Institute was held at Hampton on Thursday and Friday. Oct. 3rd and 4th. About fifty teachers enrolled. Among those present were Chief Supt. Crocket, Inspectors Wetmore and Carter and John March, Esq. The following officers were elected:

President, J. C. Robertson, principal at Collina: Vice-President, C. E. Black, Springfield. Secretary-Treasurer, W. S. W. Raymond, principal of Superior School, Springfield Corner. Committee of Management, Miss Beatrice E. Duke and F. E. Whelpley, Superior School, Hampton.

A public meeting was held on Thursday evening, at which several interesting addresses were delivered by prominent educationists attending the institute and others. Papers were read by Miss Beatrice E. Duke on Methods of Teaching the Language and Literature of the Text-books; S. L. T. McKnight on The Teacher's Calling, and by Inspector Wetmore on Astronomy. The latter held that every teacher should be able to explain the theory of the tides, eclipses, etc., the differences of time, and the reason of the changeable positions of the moon toward the north and the south, and the phenomena. The study could be made intensely interesting to the pupils.

The annual meeting of the Carleton County Teachers' Institute will be held at Woodstock on Thursday and Friday, Oct. 17th and 18th. There will be an exhibition of manual work from the schools of the county. Teachers and trustees attending the meeting can get a return ticket at one fare on the N. B. R. on the 16th and 17th, good to return up to and on the 21st.

Annapolis County, N. S., Teachers' Association.

The tenth session of the Teachers' Association for Inspectoral District No. 4, Nova Scotia, was held in the Annapolis Academy on the 19th and 20th Sept. The officers elected for the ensuing year in addition to Inspector L. S. Morse, A. B., President *ex-officio*, were as follows: Jas. W. Armstrong, Vice-Pres.; M. H. Clarke, Sec.-Treas.; A. D. Brown, W. M. MacVicar, Miss R. N. Blackburn, Miss Carrie Davis, Executive Committee. W. C. Parker read a capital paper on "Proper Incentives to Study." First, school surroundings should be made as attractive as possible. Second, prizes, reward cards and monthly reports are generally useful. Third, lessons on natural science or history, revealing the wonders of nature around them, may be made incentives to high and profitable efforts in study and observation. C. W. Shafner, J. W. Armstrong, A. D. Brown, M. H. Clark, W. M. MacVicar, Miss Belle Wiswell, Miss J. A. Hamilton and Miss S. R. Jackson took part in the discussion, differing from the essayist generally in not favoring prize giving. M. H. Clark read a valuable paper on "The Bodies of our Pupils," showing first what should be avoided, and secondly what should be done — gymnastic exercises, playground sports under the eye of the teacher, better hygienic conditions in the school-room. Miss S. R. Jackson, teacher Elementary Department, Annapolis Academy, gave an interesting model lesson on the rocks of the province to pupils of Grades III. and IV. A. D. Brown emphasized teaching the natural features of our *own* country. J. H. Balcolm claimed that more time might be found for oral lessons on nature in miscellaneous schools. O. H. Cogswell, of the Summer School of Science, gave a sketch of the practical training in this department given at Parrsboro last summer. Rev. J. J. Ritchie gave an eloquent address in which he laid special stress on the elevating influences of the study of nature, and paid a well merited compliment to the educational progress of the province. Miss Belle Wiswell read an important paper on "The Moral Influence of the Teacher." John A. Smith read a practical paper entitled "The Best Method of Reading and Teaching History." Miss Jennie A. Hamilton, teacher of the Primary Department of the Annapolis Academy, gave a kindergarten lesson to pupils of Grades I. and II. This exercise was one of the most interesting of the session. Miss R. N. Blackburn read a paper on industrial drawing illustrated by a blackboard lesson.

A communication from the Women's Christian Temperance Union of Annapolis Royal was read; and on the motion of A. D. Brown, seconded by O. O. Lyons, a resolution in sympathy with temperance teaching in the schools was passed unanimously. Miss Francis Harrington, organist, received a hearty vote of thanks for the musical entertainment of the Association; and the Academic staff for the tasteful and elegant adornment of the building in which they held their session. The work of the Association was not dependent on any outside aid; and can be said, therefore, to be more than usually successful.

P. E. I. Teachers' Convention.

The tenth annual meeting of the Provincial Teachers' Institute of P. E. I. was held at Charlottetown on the 3rd and 4th of October. These gatherings have always been popular with the teachers of P. E. I.; they meet their friends and former associates, exchange experiences, mingle in a society brighter and more exhilarating than that of their school district, and when they return to their labors they do so stimulated and encouraged by what they have seen and heard and the scenes in which they have acted their part. On the present occasion there was a good attendance of teachers and the interest in the proceedings was well maintained throughout.

The President, Mr. Lemuel Miller, took the chair on Thursday morning, but after the transaction of some routine business the meeting adjourned till the afternoon out of respect to the memory of Professor T. A. LePage, whose death that morning had just been announced to the convention.

When business was resumed papers on "Temperance Instruction in our Schools" and "Drawbacks in our School System" were read, the former by Mr. James H. McLeod, the latter by Miss Lynch. An address was also delivered by Mr. John McSwain, Principal of the Model School, on the Teaching of Drawing to Young Children, and thereafter Mr. J. M. Duncan gave to a class of boys a lesson on the drawing of straight lines and curves. The papers, address and lesson were much commended by the meeting.

The usual public meeting took place in the evening. Several gentlemen addressed the audience after a few very appropriate and well chosen introductory remarks by the President. Rev. Mr. Read spoke strongly and eloquently on the indispensableness of high moral training in our schools, and the danger of education, at the present time, lapsing into an exercise in those subjects which can most readily be converted into money. Dr. James McLeod selected the brain for his theme, and, in an excellent address on the structure and functions of that organ, he not only imparted much valuable knowledge but emphasized its practical importance to the teacher as knowledge of the delicate instrument which it is his duty to endeavour to understand how to manage wisely and well. Senator Howlan and Rev. Mr. Lloyd addressed words of encouragement to the teachers, but the latter also impressed upon them the great value of musical study. A class of girls was also present, and at intervals, under the direction of Miss Barr, Principal of the Upper Prince Street School, contributed selections of music which were highly appreciated.

On Friday morning the committee which had been appointed to draft a resolution in regard to the death of Mr. LePage presented the following, which was unanimously adopted by the convention:

> *Resolved*, That we put on record our very deep sense of the loss sustained by this Institute and by the whole Province in the death of Prof. T. A. LePage, an honored and valued member of this Association.
>
> *Further Resolved*, That the Secretary be requested to send a copy of this resolution to the brothers and sister of the deceased, and to convey to them the deepest sympathies of this Association in their sorrow.

During this and the afternoon session essays were read by Miss Barr on "Our Girls," and by Mr. Neil McLeod, Summerside, on "Chemistry," while Miss McKinlay read a communication from Mrs. Condon on kindergarten work. These papers met with the hearty approval of the Institute.

The proposal was made and cordially adopted to appoint a committee to confer with the Education Department respecting the formation of a Teachers' Library, and to empower them to expend $100 towards that purpose for the present year should the scheme be found practicable.

The undermentioned members of the Association were appointed officers for the ensuing year, after which the convention adjourned:

President, Mr John Arbuckle, Inspector for the W. district.

Vice Presidents, Prof D. J. McLeod, Prince of Wales College, Elden Stewart, Principal of Georgetown School, Miss Janetta McPhail, Summerside.

Secretary Treasurer, Mr John Wickham, Principal Queen Square School.

Committee, Mr C. W. Kielly, Stanley, Mr John McSwain, Principal Model School, Mr. William Thomson, Little York, Miss L. McKinnon, Charlottetown, Miss Stella McDonald.

PROF. T. A. LePAGE.

On Thursday morning, 3rd inst., there died at Charlottetown Mr. Thomas A. LePage, one of the Professors in the Prince of Wales College. He had been in delicate health during the past two years, but continued to perform the duties of his office till last February when rest became actually necessary. Retirement, however, did not bring the much needed strength, for he continued to languish until the end came at the early age of thirty-two.

Born at and residing in Charlottetown he became, when only twelve years of age, connected with the Prince of Wales College by joining the preparatory school connected with that institution. Two years subsequently he entered the College, and during a course of four years prosecuted his studies with remarkable assiduity, ability and success. At a time (anterior to the amalgamation of the College and Normal School) when the quality of the students was particularly high in proportion to the number in attendance, when the study of the subjects of an academic course was carried much farther than is possible under present circumstances, and when for years the College reached a standard of excellence unattainable by the combined institution, Mr. LePage graduated with highest honors, and rightfully assumed his place among the few whom the College gladly acknowledges the worthiest of her offspring.

Mr. LePage passed one session with great distinction at Dalhousie College, and as this was the only connection which he had with any other of our higher educational institutions, he may justly be claimed by the Prince of Wales College as peculiarly her own. Nor was she slow to acknowledge his merit. In 1876, a vacancy having occurred, he was invited to supply it for one year, and two years later he was appointed to a permanent position upon the staff.

Eleven years of sound, faithful and intelligent work cannot have been without good and permanent results on the education of the Province, and we are certain that many of the students who came within the range of his influence not only felt it but was greatly benefited by the contact. And, as this period is almost co-extensive with the existence of the Prince of Wales College and Normal School in its present form, nearly all the students who have passed into the country are among the number. Hence the widespread regret and sorrow so prevalent among members of the profession, and the pain of many of them who in Mr. LePage have lost a kind and thoughtful friend.

UNIVERSITY OF DALHOUSIE.

Professor MacMechan, Ph. D., (Johns Hopkins) delivered the inaugural at the opening of Dalhousie University last month. His subject was "Concerning the Earliest English Literature," which he treated in a striking, thorough, yet popular manner. He justified the use of the term Old English as preferable to Anglo-Saxon, and fully illustrated the relation of Old English to general German literature. English literature is not one of shreds and patches but an organic whole.

Attorney General Longley followed in an interesting speech in which he took the occasion to denounce the pressing of the study of the ancient classics upon students. The courses of studies insisted upon should be such as to develop the ability to deal with the industrial potentialities of our country.

President Forrest in opening alluded to the continued remarkable success of Dalhousie students during the past year. A lady graduate, Miss Richey, had been made a Ph. D. of Cornell. James Creighton was appointed an instructor; and Gordon Laird won a Fellowship at the same institution also. Alex. Fraser received a Fellowship at Harvard, D. A. Murray won a Fellowship at Johns Hopkins, and Mr. Trueman, a graduate of two years standing, had been appointed a professor in the Alleghany University.

MUNRO EXHIBITIONS AND BURSARIES.

At the matriculation examinations of the University the following proved to be the fortunate competitors:

Junior Exhibitions.

First, $300, J. W. Logan, Colchester, N. S., (Picton Academy).
Second, $300, T. C. McKay, Halifax Academy.
Third, $300, E. W. Forbes, Halifax Academy.

Junior Bursaries.

First, $200, B. Dodge, Halifax Academy.
Second, $200, R. J. Grant, Sunnybræ, (Picton Academy).
Third, $200, Harriet Jamieson, Halifax Academy.
Fourth, $200, D. M. Robinson, Sussex, N. B., (Picton Academy).
Fifth, $200, A. S. Barnstead, Halifax Academy.
Sixth, $200, James Rankin, New Westminster, B.C.
Seventh, $200, J. A. Mackintosh, Halifax Academy.
Eighth, $200, Geo. Arthur, Prince of Wales College, P. E. I.
Ninth, $200, Lucy C. Murray, Ladies' College, Halifax.

Senior Exhibitions.

First, $300, J. B. McLean, Hopewell, N. S.
Second, $300, J. W. Brehaut, P. E. I.
Third, $300, J. W. Tupper, New Glasgow, N. S.
Fourth, $300, C. B. Robinson, Pictou.
Fifth, $300, D. D. Hugh, P. E. I.

Senior Bursaries.

First, $200, T. F. West, P. E. I.
Second, $200, C. L. Moore, New Brunswick.
Third, $200, A. O. Macrae, St. John, N. B.
Fourth, $200, E. J. Jordan, P. E. I.
Fifth, $200, Agnes S. Baxter, Halifax,
Sixth, $200, F. A. McMillan, P. E. I.
Seventh, $200, W. H. Magee, Digby, N. S.
Eighth, $200, C. E. McMillan, Cape Breton.

Astronomical Notes.

The sun souths very fast during September and October, and as a result our days grow shorter very fast. The last date for which the lengths of daylight, twilight and night were given was September 1st. (See July REVIEW.) Here follow the figures for the day of the equinox and for the first days of October and November:

SOUTH OF NOVA SCOTIA.

	Sept. 22.	Oct. 1.	Nov. 1.
Daylight, ...	12h. 9m.	11h. 43m.	10h. 15m.
Twilight, ...	3 13	3 11	3 14
Night, ...	8 38	9 6	10 31

NORTH OF NEW BRUNSWICK.

	Sept. 22.	Oct. 1.	Nov. 1.
Daylight, ...	12h. 11m.	11h. 39m.	9h. 56m.
Twilight, ...	3 30	3 27	3 30
Night, ...	8 19	8 54	10 34

Twilight, it will be observed, is shortest on October 1st, decreasing from the maximum on June 21st to the above figures, and increasing again from these values to another maximum of less amount on December 21st. The minimum really falls, in this latitude, not on October 1st but October 9th, but the difference for these dates is very little. Of course it is "astronomical" twilight that is meant.

Look at the "Equation of Time" column in the almanac, and you will see that this quantity is much greater for October and November than usual — greater from October 17 to November 18 than at any other time during the year. What this means to places where local mean time is kept, you will find explained in the astronomy books. What it means to places where standard time is kept will perhaps surprise some of the opponents of that kind of time — and perhaps some of its friends also. There are still some people in the provinces who kick against standard time. "Use and wont" are of course at the bottom of their objections, but with many there is a notion that their local time is *true* time. The greater the difference between standard and local, the stronger are the objections and the more persistent the kicking. At Yarmouth the difference is 24½ minutes, and many people even in the town still swear by local time. It would probably surprise these people to be told that from October 7 to November 26 standard time (60° time) is *nearer to true sun time* than their local time is. At Picton, where the difference is about 11 minutes, standard time is truer than local time from September 17 to December 12. This is not put forth as an argument for standard time, but merely to show the falseness of the very common notion that local time is true sun time.

The moon began her October work by occulting Jupiter on the morning of the 1st. That was the ninth time for this year. She will do it again on the evening of the 28th, but not for our benefit. When she rises to us on the 12th she will be passing out of the Hyades, the uppermost star in which (Epsilon Tauri) she will occult to places to the south and east of us. On the night of the 14th she will occult two stars in Gemini — Eta 3½ magnitude and Mu 3 magnitude. The first of these occultations will be visible over all the Atlantic provinces — disappearance a little after 10, reappearance a little after 11. The occultation of Mu will not be visible in the extreme south of Nova Scotia. At Yarmouth there will be a very close shave at 3 a. m. The farther north and west you are from Yarmouth, the better chance you will have of catching this occultation. But 3 a. m. is rather an inconvenient hour, and a small glass will do very little with a third magnitude star when close to the moon. A close shave, however, is a very pretty sight. We had one at Yarmouth early in the morning of March 14th last. It was Saturn, and the shave was so close that the near edge of his ring seemed to all but graze the moon's limb.

The next new moon will be 31 hours old at sunset on October 25. Those who have not yet seen so young a moon will then have an opportunity of trying to do so. On the 28th she will be near Jupiter. If you run your glass that evening about 6° to the left of and above the moon, you will see a pair of fifth magnitude stars (Nu Sagittarii). Next evening they will be a little to the right of her. On November 2 about 8 in the evening she will be south of a pretty triad of fifth magnitude stars (Psi Aquarii).

Venus, Mars and Saturn are still morning stars and may easily be recognized by those who watched their hand-shakings at the end of September, as noted last month. Mercury and Uranus are good-for-nothing evening stars during the first half of the month. They both pass the sun on the 15th. Uranus will interest us no more until March. Mercury will be on his very best behaviour as morning star during the last week of October, and will be easily visible for a week or more into November.

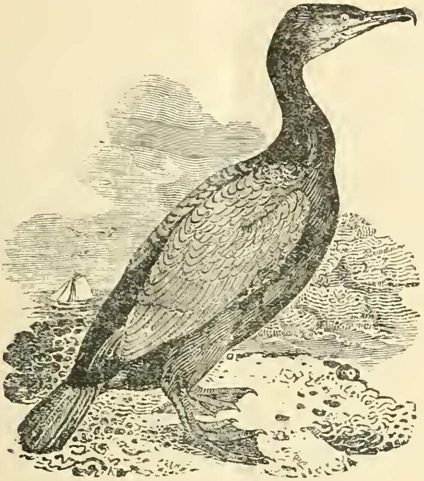
The only evening star for the month is Jupiter. October will be a good time to watch his motion among the stars. Before August 25th he was moving west. On that day he came to a stand near 4 Sagittarii, a fifth magnitude star now some distance west of him. Since then he has been moving east and will so continue until the end of next May. On October 6th he will be about half a moon-breadth north of a sixth magtude star which he is now approaching. The star has no name, but the number in the British Association Catalogue of Stars is 6161, and so it is known as B. A. C. 6161. This would be a good chance to see Jupiter attended apparently by five satellites, but unfortunately his four moons will not be all visible to us that evening. On October 20th he will be on the handle of the Milk Dipper — for the third time this year — and nearly half way between Mu and Lambda Sagittarii. From then till November 10th he will be nearing a triangle of small stars (easy in a field glass). One of these stars will be found on close inspection to look less like a star than it did at first. On November 10th Jupiter will be over a moon-breadth north of this curious object. What it is you will likely be able to guess after you see it. It lies half way between Mu and Sigma Sagittarii. It has several names, or numbers rather, the oldest and best known being 22 Messier.

Don't forget to send the REVIEW the date of your latest naked eye observation of Mira. (See September notes.) C.

A GOOD suggestion is furnished our rulers in the attempt now in progress in New York to establish "a caterpillar" day. The plan is to ask every boy and man to lay aside other business and spend one day in killing these pests. It can easily be seen how valuable such a concerted movement would be. As it is now, through the improvidence or carelessness of some orchard owners these insects are allowed perfect liberty to destroy and multiply, and neighbors as well owners of said orchards have to suffer. If, therefore, on the first appearance of the grub in the spring, the authorities could induce all males throughout the country to take a hand in destroying them, not only would orchards benefit that year but their increase would be much retarded if not altogether stopped.—*Exchange.*

FERNDALE SCHOOL.

No. XXVI.—Order IV. Steganopodes.



Phalacrocorax carbo (Linn.), A. O. U., 119. (*The Cormorant.*)

S. Oh what hard names you have put around that Cormorant!

T. They are very easy — easier than common English to remember when you know them. And since the ornithologists use them I thought you would like to know them too; so that if you were talking about birds or reading about them these words would not be meaningless Greek to you.

S. Well, if you can name them plain we would like it better than anything.

T. Well, "*Steganos*" is a Greek word, easier to pronounce than the most of our English words, because it sounds exactly as it spells, and it means *covered, roofed-over, all enclosed;* and "*podes*" means feet. What do *steganopodes* mean, now?

S. Feet roofed-over — feet covered — feet all-enclosed.

T. Very good. *Steganopodes,* you see, is both short and easily pronounced. Some people give this order of birds a Latin name "*Toti-palmate swimmers.*" Guess the meaning of this name.

Jack. *Toti* will be from the same word as *total,* I suppose. *Palmate* will be from the same word as *palm* of the hand, I guess. I make it "full-palmed swimmers."

T. Very correct. What was the English name we gave this fourth order of birds, in a previous lesson?

S. Full web-toed swimmers.

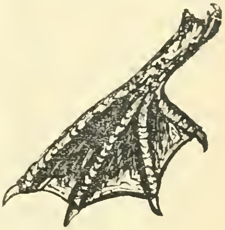
T. Then the Greek-derived word *steganopodes*—refers to *all* the toes being enclosed in the web — or covered—or roofed over with the web.

Jack. But ducks and geese are web-footed too?

T. Is every toe of the duck or goose connected with a web?

S. No. The hind toe is not.

T. Correct. Every bird which has its hind toe as well as the others connected by the membrane we call a web, belongs to this order. Make a rough drawing of the foot of the Cormorant on the board so that we see the character of the *toti-palmate* foot.



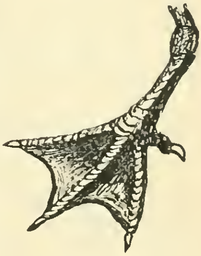
Toti-palmate Foot.

S. Here it is.

T. Will some other one of you draw a rough sketch of the ordinary palmate foot of swimming birds belonging to *other* orders.

S. Here is one.

T. You now see the difference between the feet of Steganopodes or toti-palmate swimmers and all other swimming birds. How many different birds of this order have been seen in the Atlantic Provinces?



Palmate Foot.

S. Seven, you told us before. As there are only seven I think we could remember the names of them if you wrote them down.

T. Here they are then.

1. The Yellow-billed Tropic Bird (Rare in N. S.)
2. The Gannet (very common in N. S. and N. B.)
3. The Cormorant (common in N. S. and N. B.)
4. The Double Crested Cormorant (rare in N. S. and N. B.)
5. The American White Pelican (rare in N. B.)
6. The Brown Pelican (rare, taken at Pictou, N.S.)
7. The Man O' War Frigate Bird (rare in N. S.)

Jack. If we saw one of these *seven* we could nearly guess its name. Any bird having full web-toed feet would, nearly for certain, be one of them.

T. Correct. If its nostrils are quite distinctly visible it will be the Tropic Bird. If the nostrils are not perceptible even on close examination it is one of the other six.

S. Then we have only *six* to distinguish between?

T. Yes; and if its bill is *not* hooked it is the Gannet.

S. Now we have only five species to learn.

T. Correct; but only three genera all with the upper mandible of the bill hooked downward as in the cormorant. If the *tarsus* — the shank — is very short, hardly as long as the hind toe, it is the Frigate Bird.

S. Now we have only to distinguish between cormorants and pelicans.

T. Very good. If the bill is shorter than the middle toe, the throat pouch small, and the outer toe much longer than the middle one, it is a cormorant.

Jack. Then, if the bill is longer than the middle toe, the pouch large, and the outer toe shorter than the middle one it must be a pelican?

T. Exactly. The big pouch and long bill of the pelicans make them look top-heavy.

Jack. I guess the crests of the cormorants and the colors of the pelicans will tell which of the two species we might come across.

T. Correct again. But let me explain the scientific name of the cormorant. The generic name has been taken exactly by the Romans from the Greek. "*Phalacros*" means *bald*, and "*Corax*," *raven*. Phalacrocorax, then, means "bald crow." Cormorant is likely from "*Corvus*," Latin for *Crow*, and "*marinus*," *marine*; and therefore means "Sea Crow." The specific name "*Carbo*" means *coal*. Why should this name be given?

S. Because it is coal black.

Jack. Phalacrocorax Carbo, then, means "Bald Crow Black." But it has nothing like the crow about it except the blackness. Isn't it sometimes called the *Shag?*

T. It is. Describe its color. Plumage generally—

S. Glossy, greenish black.

T. Feathers of back and wing coverts—

S. Bronzy-gray, black-edged.

T. Quills and tail—

S. Grayish-black.

T. Feet—

S. Black.

T. Length—

S. About three feet.

T. Tarsus—

S. Over two inches.

T. Bill—

S. Three or four inches. What are its eggs like?

T. Eggs three; sometimes four; bluish green, coated with white chalky substance, and about 2½ by 1½ inches, in a nest of sticks, grass, moss and seaweed, which is usually very filthy and offensive.

S. Where do they live?

T. Along our coast from Greenland as far south as New Jersey in winter time, in Europe and portions of the coast of Asia and Africa.

S. What do they live upon?

T. Fish, which they dart down upon from a great height, then toss into the air and catch it as it descends head foremost into their throats.

They are said to have been trained both in China and in the days of falconry in England to catch fish. A ring or thong was tied below their pouch to prevent them from swallowing their catch.

They are popularly looked upon as ugly, most greedy and filthy plunderers; although when mounted in the museum they make very good-looking objects. Milton, in his Paradise Lost, Book IV., 194-198, makes Satan personate the Cormorant while he surveys in malicious mood the happy Paradise.

> "Thence up he flew, and on the tree of life,
> The middle tree and highest there that grew,
> Sat like a *Cormorant;* yet not true life
> Thereby regained, but sat devising death
> To them who lived."

Shakespeare was no more complimentary to our bird than Milton:

> "He tires betimes, that spurs too fast betimes;
> With eager feeding, food doth choke the feeder:
> Light vanity, *insatiate Cormorant*,
> Consuming means, soon preys upon itself."
> —*Richard II., Act II., Sc. I.*

THE SCHOOL ROOM.

Clay Modelling in the Primary Grades.

Potter's clay or home made clay (as described in a former number) should be kept in a glazed earthen jar with a lid. "Foot squares" of stout oil-cloth should be piled neatly by on a shelf, one for each scholar. Each scholar should have a napkin or special handkerchief for wiping the clay off the hands at the end of the lesson.

Teacher Clay Modelling. James, pass around the oil-cloth squares to the first row of seats; John to the second row, Dodd to the third, and Clarie to the fourth row.

The four boys having quickly performed the work are standing "at attention" before the teacher.

T. Put a lump of clay as big as that (a cubic inch) on each square.

In a minute this is done, and the four boys are told to supply themselves.

T. (Taking a rounded lump between her two hands the teacher rolls the ball between them to make it a sphere.) Keep your fingers as straight as you can and roll the clay to make it as round as a big marble.

It is being done.

T. All ready. Stop and place the ball on your square. Those whose balls are quite round — hands.

Many hands are up.

T. Pick them up between your thumb and finger, and show me them.

The hands are extended, with many imperfect spheres.

T. Try again. Roll between your palms. Now show. Better. Some are not quite round. (Shows an ovoid form.) Is this round? No. (Shows a sphere with a hollow or protuberance.) Is this round? No.

At last all have been successful in making good spheres.

T. These are spheres. Do you know any thing else that is a sphere? Is this pear?

S. No.

T. Is this egg?

S. No.

T. Is this gooseberry?

S. Yes.

T. Name other things.

S. Cherries — marbles — some apples — currants — rubber balls — drops of water sometimes.

T. Any big spheres?

S. Pumpkins — the moon — the sun — the world.

T. Suppose you cut the sphere in two halves, what will you have then?

S. Two half spheres.

T. Here, I do it, and I call the half sphere a hemisphere. How many hemispheres are in your sphere?

S. Two.

T. Well, roll your spheres to make them perfect, and John will give a knife to the scholars in each of the back seats to divide their spheres. Do it quickly and pass the knife to the seat ahead of you. Just two minutes.

T. What part of your hemispheres are on the cloth?

S. The flat part.

T. Turn up the flat part and look at it. What is the shape of it?

S. Round.

T. Put it on a dry part of your square, and see what the shape of the moist mark it makes will be.

S. Round.

T. Stick a pin straight in the middle of the flat side so that it will not be nearer one side than another.

S. (Do so.)

T. Show. Very good. Which edge of the flat is the pin nearest?

S. It is the same distance from every side.

T. The round flat surface you can call a circle. The round moist mark is a circle, also, and your pin mark is in the centre. Which edge is the centre nearest?

S. The centre is the same distance from the edge all round.

T. Very good. Make a pin mark in the centre of the circle on the other hemisphere.

Done.

T. Now make a small sphere bigger than the head of a pin and put it in the pinmark and put the other hemisphere exactly over it to make a whole sphere. What is in the centre of your sphere now?

S. A small sphere or round grain.

T. Which side of the largest sphere is it nearest?

S. It is right in the middle, no nearer one side than the other.

T. Correct. The outside of the sphere we call its surface. The point in the middle the same distance from every part of the surface we call—

S. The centre.

T. The centre of the—

S. Sphere.

T. How far will you have to stick a pin into your sphere so as to reach the centre?

S. About half an inch.

T. If you stick the pin in anywhere will it be the same distance to the centre?

S. Yes.

T. That distance is called the radius of the sphere. Can the radius of a sphere be in some places longer and in others shorter?

S. No, it would not then be round — it would not be a sphere.

T. Roll your sphere quite round now, and stick a pin in one part of it. What fruit is it like?

S. Like a peach — like a round plum — like a small orange.

T. See who can make it look like a little apple. What must we do to make it like an apple? (An apple shown.)

S. We must make a little hollow where the stem is and a mark at the other end.

T. Well, see who can make most like this apple. Will it be a perfect sphere then?

S. No.

When enough time is given for this trial, and the results are examined by the teacher, the pins or sticks are ordered to be taken out; and the four boys first pick up the clay pellets and place them in the jar, then take up the oil-cloth squares, while the children wipe their fingers on their napkins.

For the Review.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

Second Paper.

To the timid teacher, who fears he cannot teach his class music, let me say, If you can in any way gain the power to sing correctly *soh* and *me* to any given *doh* with patience and perseverance no further difficulty will be able to keep you back. Ask some musical friend to help you thus far, and then, if you can get no more assistance, go on unaided.

Caution. Do not sing with the pupils at any time. When the teacher sings let the class listen, and when the class sing let the teacher look to see that each pupil is standing or sitting correctly, and has the mouth open — not singing through the closed or almost closed teeth — and listen carefully that all are singing in tune and giving pure, musical sounds. This is enough for the teacher to do.

Teach the class to sing softly, and especially a class of boys. There will be no difficulty in teaching to sing strong. Get the boys to use the thin register; *i.e.*, to sing with their sweet voice, like the girl's voice. This can only be secured by singing softly until accustomed to use this voice. In music, even more than in other branches, frequent revision from the first step is necessary; and the singing of these three notes of the scale should be used to tune the voices at the beginning of each music lesson. Further, the class should give the *doh* of any piece before attempting to sing it, in order to put the ears and voices in tune, thus d m s d^1 d^1 s m d, or if the key is above E, d m s m d s_1 d.

Begin the lesson with breathing exercises, and then the singing of a given tone, to find out whether all the pupils can sing in tune and give pure musical sounds, and if they have acquired the power of producing any given tone easily within the range of their voices.

Give similar exercises to those in first paper on your black-board modulator from the manual signs, and written as exercises on the black board. Finish each exercise by singing it to the syllable *la*; but in doing so point to the note sign, and be sure that the pupils are not singing from ear and memory of the tune, but actually from the notes. Carefully develop this power of singing from *note*, and not by ear from memory of the tune. Your success will greatly depend upon this. Ask out a pupil to point any of these exercises on the modulator from memory, and tell the class to sing to the pointing. As soon as possible get individual pupils to point on the modulator and sing easy exercises. This cultivates the memory of tune and accustoms the pupil to his own voice, and so gives confidence. It also indicates what progress each pupil has actually made. Further, the class will learn much from the pupil's individual singing that would not be learned from the teacher. Next, give ear exercises, as indicated in the last lesson. Then vary the exercises thus: Let the teacher sing such phrases as the following to the syllable *la*: d s s, s s d, d s d, d d s, s m d, d s m, m d s, and the class repeat the phrase, and then sing the phrase a second time to the notes, the teacher and the class making the manual signs to the last singing. The pupils will come to make the manual signs with the singing independent of the teacher. In this way many pupils will come to answer, who otherwise would not attempt to answer in the ear exercises. Before they are aware they will find they can do ear exercises. In the ear exercises it is well to change the key from time to time.

Accent and time. First draw the attention of the pupils to the accent in speaking or in reading prose, and the regular accent in verse.

Lo' the blithe' some lark' is soar' ing.
Hum' ble is my lit' tle cot' tage.

We have regular accent in music. The strong notes are sung to the down beat, and weak to the up beat. Let the teacher sing the following with strong accent on the first, third, fifth and seventh notes:

l l l l l l l l.

Let the class repeat. Then tell them that this strong accent is indicated by the bar line before the note put in these lines:

| l l | l l | l l | l l ‖.

The double line tells that you have come to the end of the piece. The unaccented notes, or those with the weak accent, are shown by two dots in front, thus:

| l : l | l : l | l : l | l : l ‖.

Get this exercise sung to d, to m, to s, and to d^1. This is two-pulse measure, when the accent is on every second pulse or beat. But in two-pulse measure we may have the weak accent first and the strong second, thus:

:l | l :l | l :l | l ‖.

Let the pupils sing this to the different notes of the *doh* chord.

When the note is to be prolonged to occupy the time of two beats we write it thus: | l :-l.

The pupils may write time exercises on the model of the following, using the three notes learned, and then these may be sung from the black board.

Be particular to get the strong and weak accent in the singing, and establish the habit, so that the pupils may come to sing always with accent which does so much to give character to music:

1. | d :- | m : m | s : m | d :- ‖.
2. | d :- | m : s | m :- | d :- ‖.
3. : s | m : s | s :- | m : s | d^1 :- | s ‖.
4. | d : m | s : m | s :- | m : s | s : m | d :- ‖.

For the REVIEW.]

In Paris.

I shall never forget my first view of the Eiffel Tower. A clear moonlight evening, a drive through the gay streets of this magnificent city, it suddenly burst on my view from the cab window. Rising a thousand feet it seemed to touch the sky, with the full moon on one side and the planet Jupiter on the other. The great electric light revolving on its summit flashed down upon the Arc de Triomphe, the palace of the Trocadero, the thronging boulevard, and a hundred other points of interest with a brilliancy that was indescribable, making the moon and big planet grow pale with envy. And in the eyes of Parisians, Paris and its great tower do outshine everything else. I could understand why Parisians so tardily seek their couches at two or three o'clock in the morning.

The cleanliness of the streets is wonderful. If cleanliness *is* next to godliness then republican Paris makes some amends for its alleged lack of reverence. In the early hours of morning, and at different times throughout the day, the dirt is swept to the sides of the streets, whence running streams of water carry it to the sewers.

What strikes a stranger in Paris, apart from its gaiety and splendor, is the absence of commercial traffic in its streets. The people seem to have no other thought than pleasure. Streams of omnibuses, street-cars, cabs pass to and fro continually, always full,—the omnibuses usually during the latter part of the day with the significant ticket *complet* stuck outside. These vehicles stop only at regular intervals, and it is amusing to see the crowd (if you are not in it) struggling for any vacant places on the roof — the favorite place — to which you mount by a stairway in the rear.

The people of Paris, more especially the middle and poorer classes, seem to live on the street. On the door steps are seated women, performing household duties that with us are usually performed indoors. Parisians prefer to dine in the streets and in front of the restaurants. Between the hours of five and eight in the evening, the gay crowds lounge over their bread, fruit and wine, with accompaniments of music, laughter and constant but good natured repartee. Occasionally a couple will start up and sedately perform a minuet on the sidewalk to the evident delight of themselves and the on-lookers.

Speaking of bread, I never fully realized, till I saw the Paris article, why it is called the staff of life. The loaf is about three feet long, a little thicker than a stout walking stick, with a very substantial crust and — very little else. I think most of the bread that tourists find in Paris was baked for their special benefit, when the great Exhibition was first planned.

The churches of Paris — nearly all controlled by government — are usually crowded with sight-seers; and while their magnificence charms the beholder the latter is called upon pretty frequently to contribute to the French Exchequer. G. U. H.

For the REVIEW.]

Primary Department.

MODELLING IN GRADE I.

Some months ago, when, at Mr. March's request, we began modelling in clay, my pupils and I entered on the work with a common and almost evenly-balanced stock of ignorance of the subject and good-will to overcome that ignorance; the results prove that we were fairly successful, and the experience gained will be invaluable in taking up this term's work.

Armed with the knowledge gained by observation of Miss Orr's methods in the Victoria School and from the manual, after a little private practice, I decided on giving the first lesson to my class. We began, of course, with the sphere. From previous lessons in form my pupils were enabled to take up more work in the first lesson than would be advisable with a new class; there were fifty-five boys present. To save time, I had previously cut the clay into small pieces about an inch square; two of those pieces were placed on each slate; after a short conversation about the model I held up we modelled a clay sphere, then some of the children drew the outline on the blackboard, using the movement approved by Prang, beginning at the lower part of the circumference and working from left to right. Then the class told me of objects resembling a sphere, and when I held up an apple they all agreed that they could mould a sphere into an apple. Taking up the second piece of clay they quickly rolled it into shape and with their pencils made two dents, one for the stem, the other for the blossom-end. Having found by private practice that a clay stem was very perishable and not at all inclined to remain in place, I decided to use twigs instead. The children brought in an abundant supply from the Square, and we found by cutting to the desired length the foot-stalks of leaves made very durable, natural-looking stems. The necessity of making their work durable should be strongly impressed on children. We did not try to fill the other dent, but contented ourselves that day with drawing the apples.

The next lesson was an improvement on the first; the spheres were more perfect, and by putting little tufts of whittled wood in the blossom-end and slightly grooving one side the apples assumed a more natural appearance. By putting two or more spheres together many articles of interest to children can be made. I tried joining two spheres and adding paws and tail—a very presentable cat was the result. The children reproduced the idea and were much pleased. Little dumb-bells, apples, oranges, and marbles are easily made and give practice.

In dealing with the cube I experienced more difficulty, finding it harder to secure uniform movements, and again the objects based on the cube did not interest them so strongly. Several lessons were necessary before we attained satisfactory results, but once the difficulty of making sharp, clear corners was mastered progress was comparatively easy. Then I combined spheres and cubes in the form of birds' nests, following out the cube till it held three or four tiny spheres. Owing to scarcity of models I relied largely on drawing to develop ideas of arrangement and design, and from the children's representations of objects I learned much that their limited command of language failed to make known.

After modelling the sphere and cube we next took up the cylinder. Here again we had trouble; out of sixty specimens only fifteen were at all presentable. Some were rolled till they closely resembled worms; others were flattened into cakes, while not a few were unlike any known object. In modelling the cylinder care must be taken to avoid depressing the plane faces,—the dent once made is difficult to remove. After several efforts the children produced better results in modelling a cylinder, and with that solid we completed the term. There was no time to form objects based on the cylinder, which with slight changes and additions may be turned into a rolling-pin, mallet, lawn-roller, mug, and many other well known articles.

In conclusion, I would like to say that added to the school lessons my pupils had the advantage of an out-door course in modelling. At the time we began work a large mass of clay was banked at the corner of Union and Waterloo streets. This source of discomfort to their elders was to my enthusiastic pupils a grand field of labor. With plenty of material they modelled in season and out of season, sometimes following up the class instructions, again branching off into experiments of their own, but always gaining in skill. From that unsightly mass their nimble fingers evolved spheres, cubes, cylinders, apples, pears, cats, pigs, cups and saucers, and had the paternal appreciation equalled mine clay modelling would have received a strong impetus.

Being of the opinion that by building for himself the child acquires a fuller knowledge of the value of labor and its products, and consequently subdues his natural tendency to break and destroy, I would prefer having my pupils make their own models rather than have them supplied ready-made. By cutting the clay to a uniform size a very neat set can be turned out, and when thoroughly dried will stand considerable wear. M. O'SULLIVAN.

For the REVIEW.]

The Institute of New Brunswick.

ATTENDANCE IN THE FIRST TEN YEARS.

The following statements, taken from a summary of the registered attendance at the Educational Institute of New Brunswick, made in 1888, at the end of the first ten years of its history, may be of interest to many of the members who read the REVIEW.

The Institute was organized in 1877, and there were no meetings in 1884 and 1888. The first four meetings, the sixth and the seventh were held in Fredericton, the other four in St. John; the first three in the month of August, the next four in July, and the last three in June.

The largest membership in any year was 232, in 1887; the smallest was 66, in 1883; the average was 139·4, the total for the ten years being 1394. The whole number of separate individuals registered as members in attendance in the ten years was 724. In the total membership, the several counties were represented as follows: St. John, 488; York, 203; Kings, 133; Charlotte, 96; Westmorland, 77; Carleton, 46; Northumberland, 41; Queens, 36; Albert, 33; Gloucester, 20; Sunbury, 20; Kent, 12; Restigouche, 12; Victoria, 8; Madawaska, 0.

From 1877 to 1883, gentlemen were most numerous; in the last three years, ladies were most numerous.

The want of persistence in attendance is noteworthy. The number of members registered at every meeting is only three—the present Chief Superintendent, the Secretary and Miss Grace Murphy. One other was present at nine meetings, viz.: the late Dr. W. Brydone Jack. Five others were registered at seven meetings, viz.: G. A. Inch, G. W. Mersereau, J. B. Oakes, G. R. Parkin and Geo. Smith. Five others were registered at seven meetings, viz.: Dr. Rand, John March, Eldon Mullin, Wm. Parlee and D. P. Wetmore. Nineteen others were registered at six meetings,—making only thirty-three persons in all who were registered as members at six out of the ten meetings.

The number registered at only five meetings was seventeen; and the number registered at only four meetings was thirty-nine. Thus no more than eighty-nine individuals, or less than one-eight of the whole number, were registered in attendance at four meetings. *More than seven-eighths were registered at three, two or only one meeting.* The percentage of new members, registered for the first time, varied from 68 per cent in 1887 to about 31 per cent in 1883 and in 1887.

Having thus stated the facts, I leave it to others to draw inferences therefrom.

HERBERT C. CREED,
Secretary.

For the REVIEW.]

In re School Registers.

There are two or three points touching our school registers and the keeping of them that have often been before my mind and about which I am just now moved to write.

One is the marking of tardiness on the part of pupils. I have known schools in which *unpunctuality* was practically taught. The boys might be five minutes late and it made no difference. But this is not usual, and it is not *the point*, The point just now is that, according to the newspaper report of the recent Teachers' Institute in St. John, the teachers there hold that a pupil is not late if he is in time to answer to his name or number. Is this right? Is it fair? Suppose No. 10 and No. 40 entered the room together, just in time for the latter to answer! They are both late, since the moment for opening school has passed. But according to the practice said to be followed in the city, No. 10 is marked tardy, while No. 40 is marked punctual. It seems to me the only proper rule is to mark everyone tardy who is not present when the roll-call begins. If anyone enters after that moment, but in time to answer to his name, let him say "tardy" instead of "present."

Another point is regarding the record of "school standing." There is no uniformity in the manner of estimating and recording this. The Board of Education should by all means publish a well-considered plan and require all teachers to conform to it. Here is a plan followed in the schools of at least one town in New Brunswick. Regularity, punctuality, deportment and progress, are each of them marked in parts of 10 or 100, and then the four are averaged. This is absurd. A boy who is almost always present, "to have some fun," and who is never late, but who never knows his lessons and behaves very badly, may make the following marks at the end of the month: 100, 95, 40, 33,—with an average of 67, which is set down as his school "standing." Another, who, for good reasons perhaps, is often absent and often late, but studies hard, makes good progress and behaves well, gets 50, 60, 78 and 80, with the same average and therefore the same "standing." This gives too much weight to the first two elements.

The third point I have to mention is the irregularity — not to say dishonesty — practised by some teachers, in calling the roll and marking the attendance at the beginning of a half holiday. I have known teachers repeatedly to tell their pupils to "come back after dinner to answer to their numbers and then they may go skating." Of course the government then pays for work that is not done. It is needless to point out the evils in this.

AN OLD TEACHER.

For the REVIEW.]

Bands of Mercy.

"The S. P. C. A. may be well enough, but I can see no sense in those Bands of Mercy.

"To instil into the minds of young children such a love for dumb creatures that they will always be ready to protect them is good, but there is so much cruelty that cannot be reached by such a society," &c., &c.

So many remarks of this kind have fallen upon my ears that the utterers of them will pardon me if I use some of them as a text for this paper.

Let me take my readers into a prettily decorated, well lighted room, in which is being held a fair, presided over by some young members of a Band of Mercy, assisted by their senior friends, the object of which is to raise funds to aid in the erection of a drinking fountain,

See the interested faces of the boys and girls who have really worked to bring about this end; and into whose minds is constantly instilled the principle, Earn what you get, work rather than ask aid.

This is not the only instance in which good work has been done in the Bands of Mercy in Saint John, and the S. P. C. A. has on several occasions received substantial assistance from the efforts of the Bands.

Happily this fair was a financial success, and the "fountain fund" was considerably augmented by its instrumentality, but supposing even that the end was not attained and the animal kingdom not immediately benefited, is it not a great matter to band together young people to work for any worthy cause.

The habits of intelligent observation and of unselfish interest which it stimulates has a tendency to develop public spirited citizens, the want of which as a class is sorely felt in the community.

The subtle power of influence for good or ill is incalculable, and the constantly expanding mind of the young offers the best field of labour.

In our efforts to benefit race, let us endeavour to mould rather than reform, to aid the S. P. C. A. by acting on the underlying causes that go to the formation of character, so that some one may see the day when the necessity for such a society will cease.

To be well employed in a good cause, to learn to work without expecting immediate results, to be satisfied to sow, feeling that whoever reaps will reap good fruit, is a lesson we would do well to learn.

AMONG THE SCHOOLS AND COLLEGES.

Henry Martyn MacKay, B. A., late Science Master in the Halifax Academy, has been appointed to the Science mastership in the Pictou Academy, where he succeeds Mr. A. H. MacKay.

We have received from Principal A. McN. Patterson the annual announcement of Acacia Villa Seminary at Horton Landing, Nova Scotia. The site is a delightful one, and under no teacher could we expect to see a boy grow into a better, all-round, well developed man.

Wm. R. Fraser, B. A., late classical master in the Pictou Academy, succeeds Dr. Lees, who has been appointed to a chair in Nebraska University, as Greek Master in the Wright High School, Baltimore, one of the local feeders of the John Hopkins University.

Inspector Robert MacLellan has been appointed classical master in the Pictou Academy, *vice* J. C. Shaw, who becomes the Munro tutor in classics in the University of Dalhousie. He becomes principal from the first of November in place of A. H. MacKay.

Victor Gladstone Frazee, B. A., has been appointed to the mathematical mastership in Pictou Academy in place of R. M. Longille, M. A., who enters on the practice of law Nov. 1st.

W. H. Waddell, English master and acting principal in the Halifax Academy, has tendered his resignation to open a private boys school after the end of October. There is room for such an institution under able management, and Mr. Waddell's well proven ability augurs great success. N. C. James, B. A., Modern Language Master succeeds him in the academy as acting principal, and V. G. Frazee, B. A., as English master until the end of October.

Graham Creighton has been appointed temporarily to the principalship of Albro Street School, Halifax.

W. E. MacLellan, LL.B., barrister and journalist, lately head master of the West End Schools of Pictou, has been appointed inspector of District 9 including Pictou County and a portion of Colchester, Nova Scotia. Mr. MacLellan's appointment is a specially good one, as in addition to his practical knowledge of the teacher's work he is one of the ablest American writers, an effective speaker, and a thorough British Canadian. If we mistake not, his influence will ere long be felt in a higher tone of manly citizenship within the bounds of his inspectorate, and eventually beyond it.

W. T. Kennedy, A. M., has been appointed to a mastership in the Halifax Academy as one of the collegiate staff of six.

Howard Murray, B. A., (London) has been appointed classical master in the Halifax Academy. He was a distinguished undergraduate of the University of Dalhousie for three years when he won a Gilchrist Scholarship and continued his studies abroad. Before going to London (where he graduated, and afterwards pursued a post graduate course in classical literature for nearly six years in all) he held with much success the principalship of the High Schools at Stellarton, Guysboro and New Glasgow, winning his Academic Diploma in 1876. When in London he received an appointment for two years to the Munro Classical Tutorship in Dalhousie, upon the completion of which the Halifax Academy was so fortunate as to secure his services. None of our colleges has an abler scholar in the classical chair or one who has been more popular as a teacher.

J. Arnold Smith, M. A., of Digby Academy, N. S., has been appointed to the principalship of the Hants Academy at Windsor as successor of Dr. Hall. Edward Fulton, B. A., (Dal.) has charge until the end of the present term, Oct. 31st.

Truro has commenced the erection of what promises to be one of the finest academic buildings in the province. W. R. Campbell, B. A., (Dal.) is principal. Academic institutions appear to have captured the goodwill of the Nova Scotian ratepayer, to judge by the rapid extension of the system in every quarter of the province.

J. B. Hall, Ph. D., English master in the Normal School at Truro, has been given given leave of absence for a year to study abroad. He proceeds to Germany.

The enlargement of the Assembly room and rooms below in Acadia College cost $1,365. Measures were adopted at the meetings in November last to give increasing efficiency to the science department of the college. A special grant for apparatus was made and Prof. Coldwell reported as follows: "The addition made last summer to the college building has greatly increased the facilities for work in my department. Twelve tables have been put in for practical work in chemistry, and last winter twenty-six students elected this subject with very satisfactory results."

SELECTIONS FROM WORDSWORTH, by A. J. George, M. A. Price $1.35. Boston, D. C. Heath & Co., publishers. Those who have studied the admirable edition of Wordsworth's prelude, by Mr. George, will welcome this companion volume. It contains lyrics, ballads, odes; narrative, reflective and elegiac poems with notes.

ELENE, an old English poem, by Chas. W. Kent, Ph. D., (Leipsic) Professor of English and Modern Languages in the University of Tennessee. Published by Ginn & Co., Boston. This is the re-print of an old Saxon poem, which, with the copious introduction, notes and glossary may be mastered by any one who is interested in early Anglo-Saxon literature.

RECEIVED.

AN INTRODUCTION TO ENTOMOLOGY, by Prof. Comstock, Cornell University.

ELEMENTARY PRACTICAL PHYSICS, D. C. Heath & Co., Boston.

COMMON SCHOOL SONG READER and PAGE'S CHOISIES DES MEMOIRES DE DUC SAINT SIMON, Ginn & Co., Boston.

LAW OF CHILDHOOD and other papers, Alice B Stockham & Co., Chicago, publishers; The CHILD and CHILD-NATURE, C.W. Bardeen, publisher, Syracuse; HAND-BOOK OF GEOLOGY, for the use of Canadian students, by Sir J. W. Dawson, Principal of McGill University, Montreal.

COMPTE RENDU DES SEANCES ET CONCOURES, Congres des Exercices Physiques, Exposition Universelle de, 1889, Paris.

TUBERCULOSIS IN CATTLE AND ITS COMMUNICABILITY TO MAN, Report late committee, House of Commons, Ottawa.

JOHNS HOPKINS UNIVERSITY CIRCULARS, Vol. VIII., No. 74.

A SUMMARY ACCOUNT OF THE WILD BERRIES AND OTHER EDIBLE FRUITS OF NEWFOUNDLAND AND LABRADOR, by the Rev. Arthur C. Waghorne, New Harbor, Newfoundland.

PUBLICATIONS RECEIVED.

In the October *Forum* Prof. Wm. T. Harris, the new United States Commissioner of Education, reviews the system of State Socialism, explained in Edward Bellamy's "Looking Backward."....Seven writers—clergymen, college professors and public men, some of them specialists of acknowledged standing—have associated themselves to discuss special questions of social interest and import in the pages of *The Century.* The opening paper will appear in the November number ... *St. Nicholas*, for October, comes enlarged and with a greater variety of contents and illustrations than usual....General O. O. Howard has written an article in the October number of *Wide Awake*, entitled, "How many Indians in the United States?" The number given is 262,620 ... *Treasure Trove*, for October, has a fine table of contents. Published by E. L. Kellogg & Co., New York....The last number of *Garden and Forest*, New York, has a strong plea against turning Central Park into grounds for the proposed Exposition of 1892. This park, it argues, is one of the most interesting creations of American genius and should not be despoiled even for a world's exposition....The *Microscope* has gone to Trenton, New Jersey, 145 N. Green Street. Dr. Alfred C. Stockes becomes editor. It has always been the best microscopic journal published for its price—$1.00 ...*Science* is ever fresh. Its weekly budget of science work and news is most admirable.

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(2) Virgil, *Æneid*, Book II.

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GREEK SUBJECT:

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Dalhousie for Munro Exhibitions and Bursaries will require also Xenophon *Anab.* Books V. and VI.

LATIN PROSE COMPOSITION:

Bradley's Arnold, Exercises 1-44.

Dalhousie for Munro Exhibitions and Bursaries will also require *Greek Prose Composition* as in Fletcher and Nicholson (A. Baillie, Kingston, Ont.) Exercises 1-28.

FOR 1891 (TO BE USED 1890-91).

LATIN SUBJECTS:

(1) Cæsar *de Bell. Gall.* Books IV. and V.
(2) Virgil, *Æneid*, Book II.

For ordinary matriculation Dalhousie will accept either (1) or (2). In addition to (1) and (2) Acadia will require Cicero, *Pro Archia.*

GREEK SUBJECT:

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LATIN COMPOSITION, &c.:

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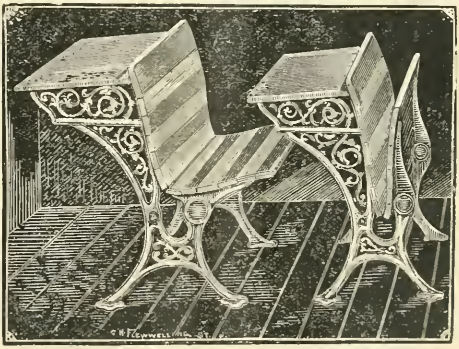

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The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

- FACULTY OF ARTS—(Opening Sept 16th. 1889).

DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 16th).

FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).

FACULTY OF MEDICINE—(Oct. 1st).

FACULTY OF LAW—(Oct. 1st)

McGILL NORMAL SCHOOL—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, [illegible]. The former as well as the new address ould be given.

EDITORIAL NOTES.

McGILL UNIVERSITY, Montreal, has created a new Faculty of Veterinary Science and Comparative Medicine. The course will be a three years' one, and, though less requirements for entrance will be demanded, the course of training will be quite equal to that required for the degree of M. D., and the degree of Doctor of Veterinary Science, D. V. S., will be granted at its close.

THE new course in Civil Engineering in the University of New Brunswick, which is outlined in another column, will commend itself to all who favor a practical turn to higher education. Prof. Strong, who is at the head of this department, is well fitted by talents and previous training to do pioneer work; and the University, while thus meeting the requirements of a practical education, will increase its list of students and send out in the future graduates more fully equipped in the useful arts.

THE sudden death of Rev. David Honeyman, D.C.L., F. R. S. C., F. S. Sc., (London,) by apoplexy at Halifax, in the midst of energetic scientific work, is a great loss to those provinces. Very few men have done and published more valuable scientific works, especially in the geological department. And a great deal of information was being rapidly put into form for publication, when he was called from the midst of his labors.

COUNTY INSTITUTES were held in Northumberland, Albert and Westmorland in October. York County Teachers' Institute will be held in Fredericton on Thursday and Friday, December 19th and 20th. Each member of the institute is requested to send to the secretary, on or before December 1st, unsigned answers to the following questions, summary of which will be submitted at one of the sessions. no single answer to exceed ten lines in length: 1. How do you train your pupils in morals and manners? 2. How do you open and close your schools? 3. Do you use detention after school for a punishment? 4. To what extent do you assign home lessons, and how do you deal with pupils who do not prepare them? 5. What are you doing to make yourself a better teacher.

DR. FITCH, of London, who made an extensive tour in Canada and the United States in the summer of 1888, recently referred as follows to the schools of Great Britain:

> "Englishmen have one habit in which they indulge far more than any other people I know—that of disparaging their own institutions and constantly complaining that in other lands schools are better than in our own. For my part I don't believe it. I have seen many schools on the continent of Europe and in America, and I believe that for accuracy and solidity in acquirement, for mental activity, and for interest in their work, the scholars in the best of our English elementary schools would hold their own, and compare most favorably, age for age, with the scholars in the best schools I have ever visited; while for the general maintenance of a good standard of primary instruction in the remotest and least favored districts in the country, there is scarcely any country known to me—certainly not the United States—which possesses equally efficient provision. Still, there is much room for improvement, and there are many details on which we may learn much from foreign systems"

THE Provincial School of Agriculture of Nova Scotia closed a prosperous session the last of October. The Director of the school, Prof. Smith, gave some very interesting details of the work during the past year. The farm in connection with the school had about paid working expenses. He spoke in high terms of the enthusiasm with which the students entered into the work. The students took charge of different departments in rotation, and towards graduation they were given charge of the whole farm.

Prof. Smith has worked in the face of difficulties for some years to establish the school of agriculture on a firm basis, and we congratulate him on the success of his efforts. That his success will be still more marked in the near future is very evident when his energy and the entire confidence he has in the importance of the work are taken into account.

IN a recent issue of the *Auk*, the ornithological journal of America, interesting notes of a trip through the Restigouche Valley are given by Messrs. John Brittain, of the Normal School, Fredericton, and Philip Cox, Jr., of the Newcastle High School. The following description of the river valley is given:

> "The greater part of the valley is in about latitude 48° N. The country is undulating, in some places mountainous, and almost an unbroken forest. Winter is very severe; snow falls to a great depth and lingers until May, while chilly east winds, from the icy Gulf, make spring late and cold. Summer, however, is warm, except near the sea, where it is tempered by cool breezes, yet the nights, even in July, and far up the valley, are occasionally frosty and cold enough to form ice."

The following notes in regard to rare birds visiting the Province will prove of interest to ornithologists:

> The *Pinicola enucleator* (pine grosbeak) has been regarded as an exceedingly rare summer resident, some ornithologists even doubting that it nests within the limits of the Province. At nearly every camping ground, however, and at other points, we either saw or heard it, and a few miles below the mouth of the Kedgwick found a nest containing one egg and three young. The nest was placed in a crevice of a rock, under a projecting shelf, and was partly concealed by weeds. The location was a cool one, for it was within a few feet of the water, on moist rock, and well protected from the sun's rays.
>
> The *Spinus pinus* (pine finch) has heretofore been regarded as only a casual summer resident, but we found it quite common, especially about lumber camps and anglers' quarters, where flocks of ten to fifteen were often seen. It is very tame.

ONTARIO AHEAD.

The following extracts from a report of the recent changes in the Ontario school system are so much in line with the drift of thought in the discussion at the Nova Scotia Provincial Association meeting a few months ago, on the matter of assimilating the non-professional requirements of our various grades of teachers' certificates with the High School curriculum, that we cannot do a better service than to quote them.

> TEACHERS' CERTIFICATES.—The examination subjects for Third Class are those now prescribed for the Primary examination; for Second Class, those now prescribed for the Junior Leaving examination, and for First Class Certificates, those now prescribed for the Senior Leaving examination.
>
> Graduation in Arts after a regular course in any chartered University in the British Dominion, will now be accepted as the equivalent of First Class Certificate non professional.

The *Educational Journal* of Toronto, commenting on this change, in a recent issue, says:

> As will be seen by the report, on another page, of the annual meeting of the Ontario Teachers' Association, the proposal to establish a system of "Leaving" Examinations at the termination of the high school courses, has been approved by the high school masters, and endorsed by the Minister of Education. (By the way, cannot a better descriptive title be found for these examinations?) The change is in the right direction, and we are glad it seems likely to be brought about with general consent.
>
> The scheme outlined by the high school masters includes, if we understand it, three distinct grades of examination papers, corresponding to which three grades of certificates are to be awarded, equivalent respectively to the present Third Class, Second Class and First Class C Certificates. The details of the scheme are given elsewhere. Whether it will involve a discontinuance of the present system, by which the Junior Matriculation Pass and Honor examination papers are used for Second and First C examinations, respectively; whether, on the other hand, those papers will be adopted for the Junior and Senior High School examinations; or finally, whether the university authorities will decide to accept the certificates awarded at the "Leaving" examinations, *pro tanto*, in lieu of their own matriculation examinations, remains to be seen. As the plan now about to be adopted was advocated by the Principal and Professors of Queen's University, the High School certificates will almost certainly be accepted by that institution. Victoria and Trinity have also, it is understood, expressed themselves as in favor of uniform examinations, and will, it may reasonably be inferred, accept these as embodying that principle. We confidently assume, of course, that the examiners to be appointed will be chosen on some system that will commend itself to the universities, and inspire general confidence. McMaster has already virtually settled the question, so far as her Arts Department is concerned, by deciding to accept the certificate of the headmaster of any high school or collegiate institute that a given student has satisfactorily completed certain subjects, in lieu of a matriculation examination in those subjects.
>
> We may reasonably hope that the change will prove beneficial to the high schools, and to secondary education in the province. In order to effect this in the highest degree, it is, in our opinion, extremely desirable that the courses and examinations shall be so conducted as to remove, as far as possible, the impression that the one great end and aim of the secondary schools is to prepare students for the universities, and for the teaching and other learned professions. Some of the high school principals, we are glad to see, clearly recognize the desirability of this, though the proposal to make the projected examinations correspond with the requirements of the present teachers' examinations, suggests the opposite idea. The certificates to be awarded should, in each case, represent an educational course more or less complete in itself, and thus suited as a preparation for any occupation or industry. In a word, the high school graduate (we do not like that word in this connection, but cannot recall a better,) should, even if unable to pursue his studies farther, go forth into the community as a well educated and intelligent man or woman; one whose faculties, perception, rational and moral, have been thoroughly trained, and who is therefore, well prepared for the duties and responsibilities of citizenship in a free, self-ruling state.

PRIMARY EDUCATION.

Before primary education attracted the interest and attention of teachers and of the department in charge of public education the little ones in too many cases received but scant justice. Sometimes they enjoyed a share of the teacher's time, but more frequently they were handed over to the older pupils. Pressure of work in the other classes and, perhaps, want of sympathy, precluded the teacher from devoting to them that care and consideration which was their due. Special lessons on the phenomena by which they were surrounded were not dreamed of, far less the pleasant means by which the tedium and irksomeness of school-time are mitigated to the youngest pupils in our modern schools. Monotonous reading and spelling constituted to them the business of the day. In the whole procedure there was nothing to awaken the interest, stimulate the power of observation, or brighten the heart—nothing but the dull mechanical effort to overcome the difficulties of pronunciation and master the perplexing forms of words.

Much has been done in recent years to secure adequate provision for primary instruction. In country districts, where it is necessary, the primary department has its own teacher, and in towns elaborate arrangements are made to meet the demands of a larger population. Children are assembled in infant schools, and are thus, when the mind is very impressionable, brought under the influence of men or women qualified to impart such instruction as is best adapted to their years. And here, at this early age, the work of education begins, and the pupil takes the first step in that course which is intended to prepare him for the duties of life.

The age at which children enter the infant department and are passed on through the other primary grades necessitates work of the simplest kind. We must not, however, be regarded as suggesting the inference that on this account the duties of the infant teacher are light and easily performed. Far from it. Every good teacher cannot successfully overcome the difficulties of such a situation. Special appliances are necessary, and rare gifts in the teacher to enable her to employ them to the best advantage. She must be possessed of tact and judgment to guide her unerringly in the treatment of the children, and of an affectionate disposition to win their confidence and secure their love. She must have a good constitution, be cheerful, patient and active in body and mind, ready of resource and orderly in habits. It is, moreover, indispensable that she be a musician, that she be of good manners, speak with accuracy and distinctness, and be endowed with the faculty of presenting her lessons with vigor and picturesqueness. Where the teacher to whom is entrusted the initiation of the pupils in the earliest rudiments of education is so gifted the school-room becomes a place to which the children repair with pleasure, where the seeds of right principle are sown and the foundation of good habits laid, and the further advancement of the pupils from grade to grade is simplified and rendered satisfactory.

When a teacher exhibits a special talent for primary work she ought to be encouraged to devote herself to it. The habit of promoting teachers to a higher department simply because they have acquitted themselves well in the lower is not always accompanied by good results. The qualities and accomplishments requisite in a primary teacher are not necessarily those which ought to distinguish the teacher in the higher grades. It not unfrequently happens that a good primary teacher is lost by such promotion and her position assumed by one who would be a successful teacher of an advanced class. We would therefore desire to see the teacher of the primary department estimated by the quality of the work she performs, and paid a salary proportionate to its excellence and her period of service. Were this done she would be more willing to remain in that position and unreservedly devote her energies to the perfecting of her methods, while her pupils would reap the benefits to be derived from her deeper acquaintance with the nature of children, greater expertness in their management, and a more discriminating knowledge of their capacity.

Much of the early disinclination to attend school, which used to be observed in children, was doubtless attributed to the bald and uninteresting exercises which occupied their time. Now, happily, this no longer exists or does so only where reasonable efforts are not put forth to devise means by which pleasure may be communicated as well as instruction. Teachers have at last acknowledged by the methods which they have adopted that the age of the children necessitates amusement rather than serious work. They must, undoubtedly, be taught to read and spell and use the slate-pencil, but the lessons ought to be short, and varied by marching, singing, or other exercises in which they take delight. By guarding against the mistake of prolonging any part of the programme until it becomes wearisome, the children continue bright, receptive and happy throughout, and are soon led to regard the school-room with some degree of affection, and the recurrence of school-time with satisfaction if not with pleasure. And this is no trivial gain. It will smooth the way for the child in the future and secure for it one of the first conditions of success.

But this is not all. The skilful teacher can by short lessons on common things excite curiosity respecting surrounding objects. Trees, rocks, ice, snow, rain, domestic animals, etc., will be beheld with more intelligent eyes and the mind prepared for the explanation of simple natural processes which may be attempted even before the children leave the primary department. And it is remarkable how much useful information may be conveyed in this way and how long the impression then made on the mind will continue. Lessons communicated with spirit and force, and with a certain grace of attractiveness to children at this age, often cling to the memory in after life when the more pretentious dissertations of a later period pass from it and leave not a trace behind. The training of the child to attend to and remember what it hears is undoubtedly one of the most important of all the functions of the teacher. The sooner the habit is acquired the better for the child, and the earlier the discipline is begun excellence will more probably be reached and that by a method natural, continuous and pleasurable.

In this way, too, valuable moral instruction may be imparted. A well told story will produce a more powerful and lasting effect than much discoursing on morals. The narrative is remembered, and, if it be carefully constructed, the incidents can rarely be recalled without the lesson which they were intended to convey.

A primary school conducted in this way becomes a most important link in the educational chain. It prepares the child for more advanced work, it conciliates his good will for school, it educates his faculties of attention and observation, and provides him with a good foundation in morals and discipline. And the teacher who accomplishes this task with success discharges a duty requiring much delicacy, tact and judgment.

I do not, however, by any means maintain, that under these more favorable conditions, the Normal School should do nothing to advance the scholarship of its students. On the contrary, without at all obstructing its technical work, it should both directly and indirectly exert such influence as will greatly promote higher attainments in general knowledge. In my opinion, however, as regards the subjects included under the term "general scholarship," there are two leading ends which the Normal School should propose for itself: 1st. It should review the various subjects of the common school course; 2nd. It should awaken in the students a scholarly spirit. —*Principal Calkin.*

THE ECONOMIC MOLLUSCA OF ACADIA.

Mr. W. F. Ganong's treatise, to which we previously alluded as something to be expected and much to be desired, has duly come to hand in the shape of a neatly bound volume of 116 pages. The author has put together in these pages, in a popular way, but with remarkable conciseness and yet with fulness, what is known of the shell-fish of these Atlantic provinces, which are of the most interest to the masses. For the scientific specialist he also gives references to papers bearing on the subject. Thirty species are described and many are figured in excellent cuts which will enable the most unscientific fisherman to identify and name his specimen. This work will not only prove valuable to the teacher who is commencing the practical study of our mollusca, but to the teacher who is in search of interesting, nay striking materials for object lessons, and to every dweller by the sea. We note some points at random, to illustrate the character of the popular information given.

Squid is worth $4.00 a barrel, and $124,000 worth were taken for bait in the Atlantic provinces in 1887.

The edible whelk is figured and its habits described. It is a real luxury. One sandy flat in Great Britain, in Whitstable Bay, yields $60,000 worth annually; and another, the Great Grimsby fishery, is valued annually at about $100,000. What can Maritime Canadians do?

The dog-periwinkle so abundant on our shores is a member of the group which produced the famous Tyrian purple, so valuable that in the reign of Augustus one pound of wool dyed by it was sold for the equivalent of $150 of our money. Our dog or purple periwinkle will give a fine unchangeable crimson.

Our common periwinkle is the same species sold in London to the extent of more than 2,500 tons, worth $75,000 annually. The average selling price is a penny a pint. In France pins are placed beside the plates of diners for extricating the boiled mollusc from its shell. They sell at St. John for about $2.00 per bushel, and in Halifax for 5 or 6 cents per quart.

A very full account of the oyster is given. They are worth $13,000,000 annually to the United States.

At $3.00 a barrel the product of the Atlantic provinces of Canada is over $180,000 annually.

The scallop is worth $29,000 annually to the United States. In these provinces they are worth fifty cents per dozen.

The edible mussel is useful for bait, for food, as a fertilizer (mussel mud) and for ornaments. In 1873 about $1,400,000 worth was exported from Antwerp to Paris. Price in Halifax market fifty to sixty cents per bushel.

The fresh water mussel, so common in many of our larger streams, is a pearl bearer. A 56-grain pearl found in a brook near Sussex, Kings County, New Brunswick, was sold to parties in Philadelphia for $450. A 25-grain one found at Coldbrook sold for $150. A 19-grain one found at the same place sold for $150. At Little New River an 18-grain one was found which sold for $110. Several other accounts of pearls from Nova Scotia and New Brunswick selling from $30 to $100 are given.

But we have no space to proceed further. If our people thought that there might be little fortunes of from $100 to $400 held between the valves of a fresh water clam or mussel in the brook or river running near their houses, the natural history of the ignored bivalve would soon become a popular if not a profitable study.

Mr. Ganong is doing good work in putting together in such accessible form what is known of the natural history of our country. His position at present in Harvard gives him access to much information not attainable were he at home. In a previous paper he did good service in collecting and systematizing what was known of our echinodermata.

His present valuable work may be procured in the Bulletin of the Society of Natural History of New Brunswick, which can be had from Barnes & Co., publishers, St. John, for fifty cents. It will shortly be issued bound in cloth, of which we shall give due notice.

ENGLISH GRAMMAR.

How is English grammar taught in our schools, and is it yielding results commensurate with the time and energy expended upon it? Not long since, says Prof. Ladd, in the *Journal of Pedagogy*, an educated man made the attempt to assist his son in the preparation of the daily lesson in English grammar. For some time the boy, who was twelve years of age, and nearly ready for the high school, had been settling into a condition of despair over this particular study. Meanwhile the boy's use of the English language had been, under the influence of the public school, steadily deteriorating. After rummaging a big text-book for more than an hour, the father succeeded in discovering among the so-called "exceptions" what he considered the probably correct answers to most of the questions composing the lesson of the following day. These questions were afterward taken to a distinguished scholar, a student and teacher of language and philology. He could not answer them in any terms which would have satisfied the teacher of the boy or the author of the text-book on grammar. They were then shown to the very highest authority on such subjects to be found in this country, to a gentleman whose attainments in the science of language are celebrated by the world of scholars. *His* answer to these questions was a strain of unmixed invective against teacher, text-book, and school system which could tolerate such wasteful folly in instruction.

THOSE GERMANS.

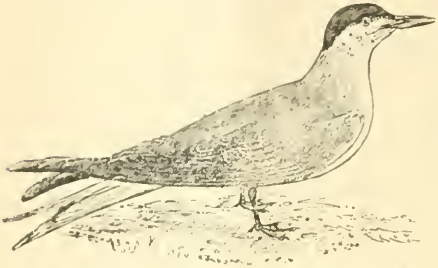
The Twenty-eighth Congress of German teachers was held at Augsburg. Here are the subjects discussed: 1. Modern Education. 2. The Urgency of an Orthographical Reform for the German Language. 3. School Reform. 4. Should Manual Training figure in the Programme of Primary Schools? 5. What can the School do to Advance the Solution of the Social Problem? 6. What Extension Should the Popular School Assume in Germany.—*L'Enseignement Primaire.*

We can understand reasons for such subjects being on the programme with, perhaps, the exception of No. 2. German orthography might be nearly called perfect when compared with the partly phonetic, partly hieroglyphic combinations of English letters. Yet on April 1, 1880, by ministerial decree, certain changes proposed by the "Society for Simplified German," such as the omission of silent *h* after *t*, writing single letters for double ones in certain words, using *f* for *ph*, etc., were made obligatory in text-books for the elementary schools of Prussia, and from April 1, 1885, in the secondary schools also. Most of the other German states, as well as the Austrian government, adopted the same rules. What more can they want, unless it is to discard their eye-torturing alphabet for the Roman?

"The school of the future must do more than we have done hitherto in the direction of mental development—must furnish better training for the hand and for the senses; must do more for the cultivation of taste and the love of the beautiful; must kindle in children a stronger appetite for reading and personal cultivation; and at the same time bring them into a closer contact with the facts of life, and with the world of realities as well as the world of books. And the public will look to you, and to such as you, to fulfil this ideal. There are many grave problems in education which remain unsolved, and which yet await speedy solution, and the answers will depend largely on the degree in which the experience and judgment of our ablest teachers are brought to bear upon them. We are yet only at the beginnings of a true science of education. Many of the deepest principles and laws of that science have yet to be discovered. It is in the laboratory of the schoolroom, and in a closer study of child-nature by teachers, that the most fruitful discoveries will be made."—*Dr. Fitch.*

FERNDALE SCHOOL.

No XXVII.—A Long-winged Swimmer.



The Common Tern. [*Sterna hirundo*, Linn., No. 70, A. O. U,

> Between two seas the sea-bird's wing makes halt,
> Wind-weary; while with lifting head he waits
> For breath to re-inspire him from the gates
> That open still toward sunshine on the vault
> High-domed of morning.
>
> Swinburne—*Songs of the Spring-tides.*

T. Let us examine this most common of our sea-birds. Is its hind toe connected by a web with the other toes?

S. No; therefore it is not one of the full-web-toed swimmers.

T. Correct. Are its nostrils tubular?

S. No; therefore it is not one of the tube-nosed swimmers.

T. Right again. Are the cutting edges of the bill fringed or finely toothed?

S. No; therefore it is not one of the lamel-billed swimmers or geese.

T. Very good. You clearly remember our previous lessons. Are its legs so far behind that the bird, when standing, is nearly erect as if its feet were placed near the rump?

S. No. It stands horizontally on its feet, which appear to be placed near the middle of its body. What are the rump-footed swimmers called?

T Very good. The Greek word for "rump-footed" birds is "*pygopodes*." We have called them the diving swimmers, from their expertness in diving. Is our specimen a diver?

S. No. It is not one of the pygopodes, judging from the manner in which its stands.

T. Correct. You will notice that its front toes are distinctly webbed showing that it must be a ——

S. Lover of the water.

T. Very good; and its tail is longer than its legs (tarsus) and its wings are also ——

S. Long.

T. So from two Latin words meaning "long feathered" we get the scientific name of the order *Longipennes*, which may be translated ——

S. Long-winged.

T. The long wings and webbed toes of this order of birds fits them for ——

S. Flying over long stretches of water.

T. What birds have you observed to be nearly continuously flying over the water by the sea shore.

S. Gulls, Terns, Jægars.

T. Very good. About twenty different species of this order have been observed in the Atlantic Provinces. The Skuas and Jægars have three distinct coverings on the hard bill, a terminal hook, a side piece, and another on the ridge of the bill nearly overhanging the nostrils.

S. Our specimen has not these, and must therefore be a Gull or a Tern.

T. Correct. Gulls have their bills thicker at the angle than at the nostrils and their bills are generally more or less curved.

S. This must be a Tern then, because its bill looks thicker at the middle and it is pretty straight. The tail is deeply forked.

T. You are right. Seven Terns have been reported in these provinces; but this one and the Arctic Tern are the only common ones to our provinces. Note the principal points of description in our specimen.

The mantle is ——

S. Bluish gray.

T. The tail ——

S. Chiefly white.

T. Top of the head ——

S. Black (in summer).

T. Is the outer tail feather entirely white?

S. No. The inner web of the feather is entirely white and the outer web quite dusky.

T. Correct. The *Roseate Tern*, seen in Nova Scotia, has both webs of the outer tail feathers white. Our common Tern has a bright vermillion-red color bill, blackish at the tip, and the feet a vermillion-orange. The Arctic Tern has the color a deep carmine red.

T. How long is our specimen?

S. Fourteen or fifteen inches.

T. Length of wing——

S. Ten to eleven inches.

T. Tail ——

S. Six inches. Fork, three and a half inches deep.

T. Its nest is usually a depression in the sand. Its eggs, two, three or four, are about one and a half inch by one and one-sixth inch, olive-buff or olive-brownish, blotched with dark brown or blackish, scarcely distinguishable from those of the Arctic Tern, and more or less similar to those of the Roseate Tern.

S. What is its name?

T. *Sterna hirundo.* The specific name is the Latin for swallows. It is often called the sea swallow.

The Crayfish in the Atlantic Provinces.

The only species of Crayfish, or "fresh-water lobster," at present known to occur in the waters of Eastern Canada is CAMBARUS BARTONII, (Fabr.) Gir., formerly called ASTACUS BARTONII. It was first reported, so far as we know, by Dr. Bell, of the Canadian Geological Survey, who found it, prior to 1859, abundant in the Metapedia, Restigouche and Metis Rivers. He tells us also (*Canadian Naturalist*, IV., 1859, p. 210) that he found a specimen in the Ouiatchouan, a river flowing into Lake St. John in Quebec. In 1865, Professor Hind (*Preliminary Report on the Geology of New Brunswick*) reported its presence in the Upsalquitch,* a branch of the Restigouche. We have found no other references to its occurrence in our waters until the appearance of Dr. Faxon's splendid monograph of this group, the *Revision of the Astacidæ* (Cambridge, Mass., 1885) in which, in the Dominion of Canada, it is reported from St. John, N. B., from the Aroostook Valley, and doubtfully from Montreal. But in 1887, a short article appeared in the *Bulletin of the Natural History Society of New Brunswick*, No. VI. (p. 74), in which attention was drawn to its occurrence in the St. John River and its tributaries, and additional testimony given as to its presence in the Restigouche and branches, and also in the Miramichi. It was predicted that it would be found also in the Nipisiguit and St. Croix.

Since that paper was published but few additional facts have come to light, and it is to call the attention of the readers of the REVIEW to this interesting question, and to ask their co-operation, that the present notes are written. Its presence in the Metis and Restigouche has been confirmed by Mr. J. W. Bailey and Mr. Philip Cox respectively, though the latter has not seen it in his trips on the Miramichi. The present writer has looked for it in vain in the St. Croix, and he cannot find that any one has seen it in the Nipisiguit, nor in fact in any rivers or streams, other than the above-mentioned, in the Eastern Provinces.

In explanation of the occurrence of this crayfish in branches of Lake St. John, Quebec, it may be suggested that it will probably be found widely distributed in the waters between that place and Montreal.

It is probable that it has spread into Eastern Canada, south of the River St. Lawrence, in late post-pleiocene times, by way of the head-waters of the Kennebec, Penobscot and St. John. Not only do the waters of the two latter rivers very closely approach each other at more than one point, but in Telos Lake and Webster Pond* they actually mingle; and there is also a close approximation of Penobscot and Kennebec waters. These animals can easily pass the low and swampy portages and perhaps even high and dry ones of not too great a length, and hence doubtless it is that they have spread into the Restigouche, via Grand River, and into the Miramichi by way of the Beccaguimec, Shiktehawk or Nashwaak, or perhaps through branches of the Tobique. It probably reached the Metis by way of the Patapedia, the head waters of these two streams closely interlocking. We should expect to find it also in the Nepisiguit, the Richibucto, the St. Croix and other streams connected by easy portages with the branches of the St. John. But as it cannot live in salt water, we do not expect to find it in Nova Scotia or Prince Edward Island. Its most northern point, then, so far as known, is the Metis, and its most easterly the Miramichi. Will any reader of the REVIEW, who can learn of its occurrence in either of the latter Provinces, or at any new localities in New Brunswick, kindly communicate the fact to the editors?

The Crayfish cannot be mistaken for any other animal. It lives in fresh water only, and is the exact picture of a small lobster. It grows to a length of about three or four inches, and is of a dark ashy-brown color. It forms burrows in alluvial lands. This species is not used for food, though some southern and western species are of considerable value for this purpose. On the other hand, it may do considerable damage to meadows where it is abundant, its burrows loosening the soil and making it more easily washed away. It is also called "Crawfish."

While we have probably but a single species, it is not impossible there may be more, particularly if they should be discovered in Nova Scotia or Prince Edward Island. The editors would be very thankful for specimens from any locality, which will at once be placed in the hands of a specialist for exact determination. They may either be preserved in alcohol, or by placing them in alcohol over night and then subjecting them to gentle heat over a stove until dry. The latter way does not give as good specimens for determination as the former, but they can be more readily sent by mail.

It is such questions as this that our teachers can profitably bring to the notice of their pupils. To ask their assistance in a definite inquiry of this sort about animals which may live in their own brooks, must have some effect in stimulating powers of observation. We propose, in future numbers of the REVIEW to call attention to other problems of a similar nature, which may be utilized in the same way.

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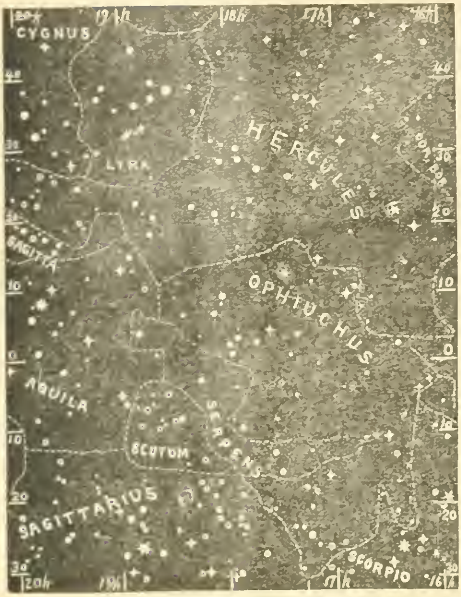
*He mentions a Micmac belief concerning this animal that is of considerable interest. "In walking up this stream I observed one of the Micmac Indians take a little crawfish and place it carefully on the bank, about two feet above the then level of the water. On enquiry, he stated that his object was to 'get a freshet' so that we might go down the Nipisiguit without difficulty. 'The little crab would bring it, and make the water rise just as high as he pleased.' He remarked that this was an old Micmac superstition, 'and a very good one,'" (p. 130).

*Thoreau, *Maine Woods*, pp. 36, 250.



THE HEAVENLY HARP.

To know the constellations and the principal objects of interest in them, all the help that is really needed is a star-map. With that and a few hours study on a few clear evenings one can easily get such a general knowledge of the geography of the heavens as will add largely to his general stock of pleasure and will enable him to read books and articles on astronomical subjects with more intelligence and far more enjoyment.

Many of the readers of the REVIEW have already scraped an acquaintance of this sort with our celestial neighbors, and we hope many more will be helped to do the same by the maps which we begin again to publish in this issue. If something better than our maps is wanted, a good star-atlas is easy to get and does not cost much. Proctor's smaller one costs five shillings, and the English edition of Klein's seven and sixpence—the New York edition costs $2.50. Larger and fuller ones are better, of course—and cost more—but these are quite sufficiently good for all the purposes of the amateur star-gazer.

Some of our readers would probably like to know a little more about some of the stars than can be gathered from looking at them on a map or in the sky. To supply a supposed want of this kind, and at the same time to put our readers in the way of making a small collection of some of the most interesting of all the sorts of celestial objects within the reach of the naked eye or of such a small glass—spy, opera, marine or field—as almost everybody nowadays can buy or borrow; with these objects in view we propose to publish from time to time a series of articles of which the following one on Lyra is the first, and the general character of which will probably be pretty much like it.

Lyra is only a small constellation, but it is interesting in several ways. The lyre painted over it on celestial globes is Orpheus' or Apollo's or Mercury's or Jubal's or somebody else's. That's an interesting thing to those who take an interest in such things. Then the constellation contains one of the brightest stars in the heavens, a star which, in the dim and distant future, will be the pole star. It contains also one of the most famous double stars, one of the most remarkable variable stars, and one of the most curious nebulas.

For naked eye and small glass observation the chief objects of interest are Alpha, Beta, Gamma, Delta, Epsilon and Zeta. On our map Alpha is the eight-point star, Beta and Gamma the four-point ones. Beta on the right, Epsilon and Zeta are the two to the left of Alpha, Epsilon the upper one. Delta is next left of Zeta. Between Beta and Gamma is 57 Messier, an annular nebula. Left of Delta is Iota, above that Theta, and then Eta. At the top is R. To the right of Alpha is Mu, below Mu is Kappa. The one above Mu and the one at the bottom I don't know. Ditto for the one at the lower left boundary line, unless it is meant for 56 Messier.

In our latitude Lyra is above the horizon for nineteen hours out of the twenty-four. Therefore at any given hour—say 9 p. m.—it may be seen somewhere in the sky on every night for about nine months in the year. (Weather permitting, of course—this is always understood in such matters.) It rises at 9 p. m. towards the end of March, and sets at 9 p. m. at the beginning of January. If 9 or thereabout is your star-gazing hour you will know from this in what months to look for Lyra, and whether to look towards the north-east, the zenith, or the north-west. In November evenings it will be coming down from the zenith towards the north-west. If you do your star-gazing at odd times anywhere between sunset and midnight, you may pay your respects to Lyra on every night in the year, for it rises at midnight on the 1st of February and sets with the sun on the 1st of March. Early in February you may see it set in the north-west after sunset and rise again in the north-east about midnight.

Its principal star—what astronomers call its *lucida*—is one of the four brightest stars that we ever see. There is no other one nearly as bright anywhere near it, and there are two small ones quite close to it making an equilateral triangle with it. This makes it a very easy object to distinguish. Its constellation name is Alpha Lyræ, but it is sometimes called simply Lyra. It is one of the few stars which still keeps its old Arabic name. This is sometimes written Vega and sometimes Wega.

Vega is first magnitude and more. That is, it is brighter than the average first magnitude star; twice as bright in fact, and so its magnitude is properly 0.2 instead of 1. (If that "and so" bothers you drop us a card; and so with any other botheration you find in these articles.)

During November there are two average first magnitude stars in sight, with which you may compare Vega; and there is another one above the average. Whether this one or Vega is the brighter you will have to settle for yourselves. And while you are at it, you may as well settle also what the colors of the four are. On this matter astronomers seem to be quite well agreed, but amateur star-gazers are not. The four are Vega, Altair, Aldebaran, and Capella.

Take a celestial globe or a suitable star-map and find the position of the pole of the ecliptic. It is on the XVIII. hour line of right ascension and about 23½° from the north pole. With this point as centre and its distance from the north pole as radius describe a circle. This circle is the path in which the north pole of the equator is moving around the north pole of the ecliptic. At present the former north pole—the north pole of ordinary speech—is near what we call the pole star, Alpha Ursæ Minoris. That is the pole star now, has been so for a long time, and will be so for a long time to come. But it has not always been so, and it will not always be so. Run your eye along the circle towards Draco, and you will find that the curve passes very near Alpha of that constellation. That was the pole star when the Pyramid of Cheops was built. Run round still farther, and you will pass near Vega. That's where the north pole was about 14,000 years ago, and where it will be again about 12,000 years hence. And then Vega will be the pole star.

And what a grand pole star it will make! More than five times as bright as our present one, which is only second magnitude. And perhaps by that time Vega will be far brighter than it is now, for it lies in that quarter of the heavens towards which the solar system is moving. But on the other hand, perhaps it will be far fainter than it is now, for there are lots of things about the stars that we know nothing about. Perhaps, indeed, it will have ceased to exist before then. Perhaps it has ceased to exist now, for the light by which we now see it started on its journey to us about the time that the Prussians and Austrians were fighting at Sadowa.

That's its distance in light-years according to the latest determinations of its parallax. One of the early determinations brought out a negative parallax. According to that, Vega must have been, as was said at the time, "somewhere on the other side of nowhere."

One more item about Vega. Taking its brightness and its distance, and doing a little figuring with them, you will find that if it was as near us as the sun is it would give us *seventy* times as much light as he gives; and, if the sun was as far from us as Vega is, he would be only a fourth magnitude star to us.

Now go out and look at Vega, and think of these things as you look.

Then take a good look at the two small stars forming the triangle with Vega. One is Epsilon and the other is Zeta. If the night is dark, and the sky is clear, and Lyra is well up from the horizon, and if moon or street or window-light don't interfere, you should see one of the two not as a mere point of light but a slightly elongated streak. That one is Epsilon. If your eye is very good you may see it split into two stars. If not, point your glass at it and you will easily double it. It is a pair of fifth magnitude stars—a very close pair to the best eye, but a very easy pair to the poorest glass. With a good telescope of three-inch aperture or more each member of the pair is doubled. So Epsilon-Lyræ is doubly double, and as it is the best known of this kind it is called the Double-Double Star.

The two members of a pair may or may not be physically connected. If not, if they seem double simply because they lie nearly in the same direction from us, they are said to be *optically* double. If there is some physical connection between them as between the sun and the earth, if one revolves around the other, or both around a common centre, then they are *physically* double, and the pair is called a binary star. Each component of Epsilon Lyræ is a binary with periods of about 300 and 500 years, and the two components form a grand compound binary with a period of probably many thousands of years.

Zeta is also double but not so easy to split as Epsilon. Epsilon's components are 3½ minutes of arc apart, Zeta's only three-quarters of a minute. But a good field glass will show the two when the conditions are favorable. If your's won't do it the first time, it may some other time. Besides the greater closeness in Zeta's case you will notice another difference between its components and Epsilon's.

If a three-quarter-minute pair is really too close for your glass, try it on Nu Draconis not far from Lyra. That's a one-minute pair and a beauty—a couple of twin stars exactly alike in size and color and almost kissing each other. These two stars—Zeta Lyræ and Nu Draconis—are two of the prettiest doubles for a field glass in the whole heavens. An astronomer with a big telescope would hardly call them doubles at all, his special pets of this kind being only a few seconds or even only a fraction of a second apart; or, like Vega, they are doubles consisting of one very bright and one very faint star. For Vega is double too, its companions being three-quarters of a minute distant, but it is only of the eleventh magnitude and so is quite beyond the reach of a small glass.

A line from Vega through Zeta will find Delta, another double, but too easy to be very interesting.

Zeta and Delta are at two of the four corners of a parallelogram, the other two corners being occupied by Beta and Gamma, brighter than any other stars in the constellation except Vega. Beta is diagonally opposite Delta, and Gamma is opposite Zeta. Near Beta is another easy double, Nu, and Gamma is a still easier one—a treble if you like, but when a small glass throws the stars as far apart as in Gamma's case, perhaps it is just as well to stop talking about doubles. We must draw the line somewhere.

Between Beta and Gamma lies the Ring Nebula of Lyra, the finest object of its kind. Its position you will find marked on the map, but you won't find it in the sky with a field glass. Still it is something to know where such a curious object is situated. You will likely find a cut and a description of it in your astronomy book. If your book is Newcomb's Popular Astronomy you will find the cut on page 460 and the description on page 461.

Look at Beta often and compare its brightness with Gamma's and Nu's. It is a variable star and a very peculiar variable, very different from Mira and Algol. (For Mira see Astronomical Notes in September REVIEW, for Algol see Notes next month—perhaps—or see your book.) Of Beta Lyræ, Newcomb says, "It is remarkable for having two maxima and two minima of unequal brilliancy. If we take it when at its greatest minimum, we find its magnitude to be 4½. In the course of three days it will rise to magnitude 3½. In the course of the week following it will first fall to the fourth magnitude, and increase again to magnitude 3½. In three days more it will drop again to its minimum of magnitude 4½; the period in which it goes through all its changes being thirteen days. This period is constantly increasing." So far so good; that's about what all the books say. It is very interesting, but it would be more interesting to the star-gazer if a date were given for one of the phases. The "greatest minimum" should fall about 8 p. m. on Nov. 14th. Compare Beta on that evening with Gamma and the nearest Nu. Then at the intervals mentioned above compare them again, and see if you can observe any change.

The star at the top of the constellation on our map is also a variable, but its range is only about half a magnitude. Its name is R Lyræ, its period is 46 days, and its next minimum is due on Nov. 21.

For the REVIEW.

Marking Absent Pupils.

On registering tardiness and school standing, I agree with "An Old Teacher," who expresses his opinion in the last REVIEW; but must take exception to his ideas on the third point to which he refers.

I believe there are teachers who occasionally allow their scholars to take, for other purposes, part of a day that is registered as taught, having a clear understanding with them that, as they prefer it to attending school on Saturday, all the time thus taken is to be made up by working after school hours.

And they occupy the time thus at their disposal with some interesting, useful work which can be made a pleasure rather than a weariness.

And instead of the Government paying for work which is not done a greater number receive the benefit than would by the school being in session on Saturday. For many children cannot attend that day as their help is required at home (especially girls); and some do not attend, as they feel they should have that day for other purposes.

Therefore, I can see no good reason why teachers should not be at liberty thus far to consult the pleasure and convenience of their scholars, exercising in all cases a wise discretion. J. B.

WE are glad to notice in the October number of the official Nova Scotian Journal of Education that the Council of Public Instruction has introduced Latin as an optional subject for the grade B diploma. This is certainly a step in the right direction. We expect among other changes in the near future that Latin will be made imperative. If any man should be an all round scholar it should be the professional teacher; and his knowledge should be much more extensive than the smaller range which he is expected to communicate effectively to his pupils. If the remuneration of the profession is to advance it can only be by the education of the scholarship and skill of the teachers as a body. No other method can be shown to have any possible chance of bettering the financial standing of the profession.

How to Influence the General Reading in Public Schools.

By Edward Manning, A. M.

At the inception of the public school system the trustees in this city made laudable efforts to improve the style of reading among our pupils. The personal labors of Prof. Munro here are not yet forgotten, and his Manual leaves little to be desired in reference to this subject. Midway in the interval of time that has since elapsed, Dr. Rand dealt with this department of education more than once in the Educational Circulars – the loss of which is much to be regretted by teachers. And, from the beginning, the minds of old educational conservatives were startled by the novel modes of the *look and say* method in the primary departments of the new schools. Altogether we may say, that more attention has been paid to this study than to any other, and rightly so I think, for it is in various ways the most important of all studies. If the advocates of the narrowest view of education insist on "the three Rs" to the exclusion of other studies for the mass of the people, there is a further step possible, namely, to insist on this one R; for if you only enable the masses to read, the obvious interests of everyday life would compel them to acquire the other two. The days, however, have long gone by for any such narrowing to be dreamt of.

If I do not enter on the initiatory departments of the study it is because I feel, that remarks to you upon it from one who has never come much into contact with this part of the work, would be out of place. I will, therefore, only notice at this stage of the subject, that some of the modern innovations of method are not quite so new as they seem; a remark that will apply even to some of the devices of the kindergarten. Erasmus, the great humorist and scholar of the Renaissance, says that "the ancients moulded toothsome dainties into the forms of the letters, and thus as it were made children swallow the alphabet." And we rather unexpectedly find the stern Jerome writing thus: "Put into the hands of Paula (a little girl) letters in wood or in ivory, and teach her their names. She will thus learn while playing." About 1650 the Jansenist teachers of Port Royal laid down the maxim that "it is best to teach children the letters only by the names of their real powers, to name them by their natural sounds," which has ever since been called the Port Royal method. A generation later the gentle Fenelon (whose delightful prose epic of Telemaque would be enough in itself to tempt one to learn French, if only to enjoy it in the original) says: "I have seen certain children who have learned to read while playing," and then urges teachers to mingle instruction with play. "Let wisdom," he elsewhere says, "appear to them only at intervals, and then with a laughing face." So also his contemporary Locke recommends instructive plays for reading and the first exercises of children "They may be taught to read," he adds, "without perceiving it to be anything but sport, and play themselves into that which others are whipped for." So Rollin, the historian, also urges that reading and spelling be taught by the use of games with pasteboard cards arranged in pigeon holes, and pleaded that school books should be illustrated, herein anticipating some of the ideas of Pestalozzi.

Turning from this retrospective glance at some of the premonitions of our primary system we come to the methods pursued in the intermediate stages. Munro's Manual associates with his instructions in reading, exercises for improving the vocal organs, and what may be called school hygiene. These exercises prepare for the production of a firm, good tone. In this connection I may add that a very good time for the reading lesson is after recess—as the lungs are then in a good state for this exercise. This is especially suitable in a school where the physical drill which Munro advocates is not carried out. The first point is to insist on a clear, distinct articulation; giving the pupils in this your own example. Younger classes profit more by imitation — precepts and principles may come in later. Fortunately for the Canadian teacher, the social condition of the great mass of our people is that of the happy medium prayed for by Agar; so that he has to combat comparatively few of the grosser errors in pronunciation of the very lowest class, nor yet those of fashion or affectation among the higher. The most inveterate faults I have found, are a disposition to clip the words too short, to neglect certain consonant endings, to avoid the use of *awe* and *ah* sounds, and to lose sight of the fact that there are two distinct forms of the aspirated dental, and consequently mispronounce such words as *thither*, *booth*, *blithe*. There is a collection of the most commonly mispronounced words in the Teachers' Edition of the Speller. Every teacher, however, might make a collection of his own on a fly leaf of his reader; and thus be kept in mind of these frequent offenders. He will find that they mostly admit of classification into Anglicisms, Scotticisms, Hibernicisms, and Americanisms. They are not numerous, but occur very often, and should always be dealt with when they do.

The great secret of pronunciation is in finishing off the syllables distinctly; and here constant and patient drill, both individually and collectively, is necessary. In this drill other things also are to be aimed at — as a pleasant tone, a comfortable pitch of voice, a flexibility in expressing the different emotions, as the class rises in intelligence and is able to appreciate and understand the phrasing of the sentence—that is, its divisions into small groups of words of connected meaning, and distinct in some measure from other groups.

As we advance into the higher grades, we can go further. In poetry, the scholars are to be cautioned that the ends of the lines are not always the places for pausing, also that, both in prose and poetry, there are stops without pauses, and on the other hand pauses without stops. Thus we put a comma both before and after a parenthetical connective and a vocative, but we pause only after it in reading. For example, "I cautioned him, however, that he must not open the box," and again in the Benedictus: "And thou, child, shall be called the prophet of the highest." To be always correct as to pause, modulation, and emphasis is no small matter; and for this as for other reasons no one can afford to neglect the preparation of his reading lesson. Bell makes emphasis depend on the three principles of novelty, contrast, and suggestion. Emphasize, therefore, the words that bring in a new idea, and any put in contrast with each other, which in a few cases affects not only the emphasis but also the natural accent, as "He must increase, but I must decrease." Qualifying words, of course, are more emphatic than the words qualified. Demonstratives are naturally emphatic by way of contrast. In old style the personal pronouns were often so used, as is often seen in the Bible and the English Prayer Book. Indeed the third personal pronoun is called by some grammarians a demonstrative, as in Latin. Of course when the personal pronouns are so used, they are emphatic. A personal pronoun qualified by a relative clause is emphatic for the same reason, as the song in the Pilgrim's Progress:

> "He that is down need fear no fall,
> He that is low no shame."

Bell adds that emphasis is one of the few points in which all good readers agree: one has to be sure, however, that he is a good reader.

Two papers in the Educational Circulars before referred to are from the pen of this writer, and are most valuable for teachers. Another by Legouvé, of the French Academy, is a delicious literary morsel—often egotistic, sometimes hyperbolical, but always dramatic, lively, and brilliant—after the manner of the Gallic mind. He dwells on the preponderating importance of the middle register of the voice, while conceding the advisability of cultivating also by careful practice the upper and lower registers, on the benefit of managing the breath so as never to be left without a certain store of it; and shows how one's position in reading affects this; asserts that a clear articulation may go far to atone for other vocal defects; lays down the sound maxim in questions of pronunciation that the rule is, to be always understood but never remarked; and illustrates at great length the phrasing pauses before referred to. He acknowledges that one should read as he speaks—but on condition that he speak well — whereas almost every one talks very ill. To speak in the sense used by Shakspeare in the famous advice "Speak the piece, I pray you," etc., needs an accomplished reader indeed. And even then the task is sometimes next to impossible. The reader may be excused for being at fault in places such as that instanced in this very paper of Corneille, who, on one occasion, could not explain one of his own lines; or in the kindred case of Campbell, who could write a ringing popular ode if any one could "Tom," said one of his literary chums, "what did you mean by these lines?

> "But the might of England flushed
> To anticipate the scene"

"I'm sure I don't know now," said the poet.

Legouvé places the highest value on reading aloud, asserting that a skilful reader is a skilful critic, and that a good reading of a passage is a sort of translation of it. Blemishes that the eye may miss are brought to light by the detective power of the sensitive ear, and the revealing power of the sympathetic voice. The whole article is an intellectual treat.

Permit me another short digression. There is more connection between reading and music than most persons imagine. In commencing music you are taught to notice three things about a note, namely, its length—indicated by its shape; its pitch, marked by its position on the stave; and the sentiment, indicated by the marks of expression, *piano, crescendo, sforzando*, etc. Now these are the very things to be noted in reading The range is narrower in speech than in song, it is true, though not so much as many fancy. We think an octave a great interval in melody, but an equal interval may easily occur in animated dialogue, only it is reached by a slide Take, for instance, the answer of Brutus to Cassius in the well known quarrel scene Cassius exclaims, "O gods, ye gods must I endure all this,' and Brutus answers, "*All* this, yea more Fret till your proud heart breaks," where we have a slide of a full octave on one short monosyllable.

Above all a feeling of sympathy with the writer must be arrived at If this is wanting, really good reading is impossible Slovenliness, affectation, monotony, and indifference vanish before sympathy, when the reader is absorbed in his subject; his voice taking on the thrill which communicates itself to the nerves of the listeners, till reader and hearers are beguiled out of themselves. Every one has now and then, alas! only now and then, heard such reading, and felt its witching charm. Some are so constituted that they cannot attain to this. Such persons can never become really fine readers. Apropos of this, it is said that the great Siddons was once drilling a young actress in the part of a deserted lover. The rendering did not please the queen of tragedy, and she said. "Think how you would feel under the circumstances. What would you do if your lover were to run off and leave you?" "I would look out for another," said the philosophic young lady. "Leave me!" said Mrs. Siddons, with a gesture of intense disgust, and would never give her another lesson. You see that the damsel was in the position of a would be artist who was color blind, or an aspirant to the opera who had what is called no ear. Some wiseacres think that any one can be taught anything, if the teacher be only competent; but we teachers by sad experience know better. It is to be hoped, however, that not many parents are quite so obtuse as a patron of a boarding school, who, when told by the mistress, driven to bay, "I am afraid that your daughter has not capacity," promptly answered, "Then, I wish, Mrs. Blank, that you would import her one."

A word on our text books here. I cannot agree with the complaints uttered against them at the late meeting of the Provincial Institute. When we call to mind those very Saharas of dryness, Town's Readers, Murray's English Reader *et hoc genus omne*, where one might hunt in vain from cover to cover for a drop of mental refreshment or invigoration, and then turn to ours, we may thank God that our scholars live and learn now, and not a generation ago. The Fourth and Fifth Readers to my mind are perfect gems If only a few lessons, say half a dozen, were taken out, with some of the miscellaneous matter belonging more strictly to the province of a speller, room could be made for lessons of more local interest, provided it were from pens of classic excellence. Perhaps more than this could be done in the case of the Sixth Reader, in which some selections are hardly so happy as in the others mentioned. The Nova Scotia edition has supplementary lessons at the end, and we also, if judged desirable, could have them; but I doubt if the series would be much improved thereby; and my doubt is strengthened by the character of those very supplements, as well as by a careful examination of some newer series, as the Maritime Readers, and other recent rivals. The fact is, that a teacher gets attached to a text book he has long used, as to an old pair of slippers or an old house; ideas cluster round it, till there is scarce a page unassociated with some happy hit, and at last he hates to change it. A newer one might be better in the abstract, but not better for him. In this connection I will venture the suggestion that if our prescribed British History is to be made the best of, it should be used as a supplementary reader; for it is of high literary style, requiring careful attention to make it properly understood and appreciated by young people. And parts of the reader which elucidate it should be read in connection with it.

It can hardly be necessary at this time of day to suggest to trained and experienced teachers how to use these books. To do so would be to drop into trite commonplace. The home preparation and school drill, the simultaneous exercising of the children's voices in imitation of, or in concert with their instructor, beguiling the diffident out of their timidity at the sound of their own voice, and merging the over forwardness of the bold in the general mass, the fixing of the sense by composition exercises, vocal or written, and so on—these are daily in full swing in every school house in the land, and need not occupy much of the time of a Teachers' Institute. Some writers have proposed elaborate variations—one in my possession as many as fourteen: Concert reading, one pupil naming pauses; individual reading, class naming pauses; reading to a mistake; reading in couples; giving parts in dialogues; choosing sides, as in spelling matches, the class imitating one pupil; naming one pupil to read till another name is called; voting for best reader; dictating a lesson to be read next day; medley reading, like a round in singing; volunteer reading; and giving examples from playground talk: some of which may be novelties, but open to the objection made to one of those smart people who are always seeking to astonish us: "What is true in all you have said is not new, and what is new is not true."

The great thing is to secure intelligent interest, by seeing well to it that the school understands, appreciates and sympathizes with the lesson studied, which in our text books we can certainly do.

The title of this paper may, however, be said to cover wider ground than the reading lesson in school. The conscientious teacher will endeavor to influence the reading of his scholars outside of the school course. The flood of cheap publications which appears in the windows of every business street, shows that reading habits are vastly on the increase; while the greater frequency of myopia in young persons reminds us of one part of the price we pay for it. A teacher should read to the pupils weekly some valuable passage suitable to their age and interests. Older pupils may be directed where to go for information on any special subject. School libraries deserve a more generous support than they obtain. High class poetry and oratory should be committed to memory and recited. There is no valid objection against deepening impressions of historical fact by the use of historical fiction. Therefore Scott, Irving, Dickens, Thackeray, Kingsley, Lytton, Reade and Blackmore, and again in poetry, Shakspeare, Scott, Gray, Wordsworth, Longfellow and Tennyson may be recommended to a senior pupil where they will assist his work. The same may be done in other departments. In science, for instance, the pupil may be directed to Wood's charming books on Natural History, to Faraday's Lectures, Wilson's "Five Gateways of Knowledge," the various Science Primers or the Boston Guides to Science Teaching. Some of these may be procured at public, church, or school libraries, others purchased by the pupils themselves. A prevalent tendency is to magazine reading, which often fritters away the time to little purpose. A promising pupil should be urged to read in some special direction, and not wander purposeless through everything that comes in his way.

Boys hanker after books of adventure. Lead them then to discriminate between the good and the bad. Defoe, Marryat, Thomas Hughes, Ballantyne, Mayne Reid, and Kingston can be safely trusted in their hands. Excellent biographies abound, inciting emulation of great men. It to is be regretted that works on Canadian life are so few. But Canada as a whole is not yet a quarter of a century old, and I think we may soon look for this field to be occupied.

In reference to the shoals of books of the lower class, both teacher and parent should point out their impractical views and false estimation of life and character, and their neglect to supply any guiding principles of conduct. The safest antidote, however, is the cultivation of a taste for reading which is better. In these efforts we have need of patience and hopefulness unbounded, and when we have done our utmost, we form only one of many educational influences. We have further need of the sympathetic aid of parental solicitude, of the press, the pulpit, and society in general. It is a hopeless task to pull against the strong current of public opinion. If bad literature lies on the table at home, the young will suffer from it. If the journals familiarize their minds with details of crime and jests on vice, they will presently be led by each flippant phrase into cynical indifference as to right or wrong—with what results we know only too well. To guard them in this direction, however, is the province of the parent—the teacher has done his part if he has striven so to occupy the soil with good crops, that the weeds may find little room for growth. And having rough hewn our ends aright we must leave them with trust in the abler hands of the divinity that shapes them.

Teachers of District No. 10.

In accordance with my usual custom, I desire to call your attention to the following plan of science work for the winter term. The book used is in the "Science Primer" series (Physics by Balfour Stewart), and costs thirty cents. The Roman numerals refer to the weeks, beginning with Monday, Nov. 11, and the Arabic to the paragraphs in Primer. It is intended that three lessons per week, of from ten to fifteen minutes, be given. The oral lessons for remaining two days can be on "health,' "natural history," as in pages of REVIEW or "Nature Readers," or any subject you may fancy yourselves. I trust to find you, on my visit, doing the work of that particular week. Make yourselves thoroughly familiar with the lesson before coming to class. Take part of every Saturday afternoon to provide for simple experiments. The subject is an interesting one, and pupils will be interested just in proportion to your energy and facility in teaching, both of which will come with thoroughness of preparation. With care the illustrations will interest all. Encourage pupils to experiment themselves at home or in school. The plan is merely an outline, to be filled in according to time and resources:

I. Motion and force, with ex. 1–3.

II. Gravity, etc , 4–7. See also Calkin's Geography, p. 2.

III. Centre of Gravity. The Balance, 8–10. You can probably bring both scales and steel-yards to school-room to illustrate these lessons.

IV. The three states of matter illustrated. Ex. to show properties of solids, 11–15.

V. Properties of liquids, 18–22. Where experiments are impracticable, illustrate by diagram on blackboard.

VI. Pressure and buoyancy of water, 23–25. Carefully illustrate this. Improvise example of your own.

VII. Same, 26–28.

VIII. Pressure and weight of air, 29-30, and Geography, p. 19.

IX. Barometers, 31-32.

X. Air pump, illustrated by diagram.

XI. Water pump, do., and, if possible, make a model. Attempt it, anyway, all of you.

XII. Work and energy.

XIII. Sound, 40-43.

XIV. Mode and rate of motion of sound. Echoes.

XV. Nature of heat. Expansion.

XVI Thermometers.

XVII. Further lessons on expansion.

XVIII. Latent heat, 58-60.

XIX. Evaporation. Try example 42. Show expansion of water when converted into ice, and contrast with contraction of metals by same cause.

XX. Illustrate condition and connection of heat by examples 46 and 47. Radiation of heat.

XXI. Velocity and reflection of light. Illustrate the bending of rays of light in water. Geography, p. 19.

XXII. Prisms, lenses and magnifying glasses. Bring glass pendants from hanging lamps, spectacles, etc., to school room.

Wishing you all a prosperous winter,

I am sincerely yours,

E. J. LAY.

Amherst, Oct. 28, 1889.

New Course in the N. B. University.

The following, taken from the calendar of the New Brunswick University for 1889-90, is an outline in full of the new course in civil engineering.

CIVIL ENGINEERING AND APPLIED MECHANICS.

The course of instruction in civil engineering will consist of the following:

Mechanism, and the art of constructing various engineering works, as railroads, bridges, etc.

Under Applied Mechanics the subjects treated of will be:

Hydraulics, embracing the structure and use of hydraulic machines, the investigation of the laws which govern the flow of water from reservoirs, and the flow of water in rivers, canals and conduit pipes, and the use of water as a motor.

Mathematical calculation and graphical representation of the strains upon framed structures; strength of materials used in construction; estimation of resistance due to friction and rigidity; work; inertia; energy.

The course of instruction will include the general description of the steam engine, and the theory of heat with its application to heat engines.

Students will also prepare, under the personal supervision of the Professor, designs of plans, elevations and sections, with specifications and estimates, of such works as are usually undertaken by engineers.

DESCRIPTIVE GEOMETRY AND DRAWING.

This part of the course will include: A knowledge of the use of the various drawing instruments; geometrical drawing; orthographic projection, including penetrations, sections, developments, etc.; tangent planes and normals; graphical determination of spherical triangles; orthographic, stereographic and other projections of the sphere, with their applications to map drawing; axometric and isometric projection; shades and shadows; mathematical perspective, with the perspective of shades and shadows.

Students will be required to make accurate drawings to scale from measurements taken during actual surveys. Special attention will be paid to neatness, lettering and colorings of such plans and drawings.

SURVEYING AND PRACTICAL ASTRONOMY.

This course will comprise practical work in the field and observatory with explanatory lectures.

The object in view will be to impart a thorough knowledge of the use and adjustment of the transit, theodolite, level (dumpy and Y), compass, sextant, and other field instruments.

The field work will be carried on under the personal supervision of the Professor, and will consist of: A chain survey, an angular survey, a contour survey, the location of a line of road, including preliminary surveys, ranging of curves, levelling and setting out work. Students are required to take topographical notes from which plans of these surveys are afterwards drawn, and the usual quantities taken out as in actual practice.

Instruction will also be given on the use of the meridian transit instrument, the altitude and azimuth instrument, in the determination of time, latitude and longitude (by lunar culminations).

In addition to the above, the lectures will contain a consideration of the instruments and methods employed in geodetic surveying, geodetic levelling, barometric levelling and hydrographic surveying.

MATHEMATICS AND MATHEMATICAL PHYSICS.

The course in these subjects will be the same as is taken up in the ordinary arts course, with the addition of portions of the honour course, selected with the view of preparing the student to understand more clearly the higher branches of engineering.

NOVEMBER.

The clouds are putting out the sun; they've shut off all his heat;
The frozen ground in heavy thuds complains of passing feet;
The meadow brook runs still and dark, the tree-tops sway forlorn,
But in the barn with merry shouts, the boys are husking corn.

F. L. Benedict, in Treasure Trove.

AMONG THE SCHOOLS AND COLLEGES.

The County Academies and many high schools in Nova Scotia are rapidly becoming colleges in one sense of the term. That is, for the same students there are two, three or more teachers, each having his own special class of subjects to teach. To the Truro Academy we notice the appointment of an additional collegiate teacher, Mr. Homer Putnam, B. A., (Dal.) In New Glasgow, a third collegiate teacher has been added to the High School staff—Miss Antoinette Forbes, B. A., (Dal.)

The Pictou Academy under its new principal, Robert McLellan, Esq., has opened with a large attendance.

In the Halifax Academy the Roman or phonetic pronunciation of Latin has been adopted. Howard Murray, B. A., (Lond.), late Munro Tutor in Dalhousie College, is the Senior Classical Master, and W. T. Kennedy, Junior Classical Master.

Edward Fulton, B. A., (Dal.) leaves the Hants County Academy with public praise to enter upon the duties of the English Mastership in the Truro Normal School, in the place of Dr. Hall.

J. Smith, M. A., (Mt. A.), late principal of the Digby Academy, takes charge of the Hants County Academy at Windsor.

Graham Creighton, Esq., has been appointed to the principalship of Morris Street School; W. A. Creelman, Esq., to the second department; and E. Ross, Esq., to the second department of Albro Street School.

BOOK REVIEWS.

Handbook of Geology, for the use of Canadian students, by Sir J. William Dawson, C. M. G., LL. D , F. R S., etc., Principal of McGill University, Montreal. Dawson Bros , publishers. That distinguished scientific worker, Sir Wm. Dawson, has found time amid pressing duties to publish a work of convenient form and especially adapted for Canadian teachers and students of geology. The first part relates to the general principles of the science with examples as far as possible from Canadian rocks and minerals. The second part gives an outline of geological chronology, illustrated by Canadian rock-formation and fossils. The third part gives details as to the physical geography and geology of Canada. The author's worldwide reputation, and his great experience and knowledge of this subject, makes the work of the greatest value to students and geological enquirers.

An Introduction to Entomology, by Prof. J. Henry Comstock, Cornell University, published by the author, at Ithaca N. Y. We cannot speak too highly of this work as a text-book on entomology. It is not yet completed. The present part takes up the orders: I , Thysanura; II., Pseudonoptera; III., Orthoptera; IV., Physopoda; V., Hemiptera, and VI., Neuroptera, leaving Orders VII. (Lepidoptera), VIII. (Diptera), IX (Coleoptera) and X. (Hymenoptera) for the second part. It is particularly marked by clearness, the selection of common type specimens, new illustrations, with the most systematic arrangement. It will enable the student to classify insects with the facility which the best botanical primers enable him to do with plants. The key to classification is one of the most striking and most useful features, as without classification there is not likely to be collection or observation on the part of many possible entomologists. If it is concluded as it has been begun, it will be the best, if not the cheapest, book for those who commence the study of our insects.

Elementary Practical Physics, a Guide for the Physical Laboratory, by H N. Chute, M. S , teacher of Physics in the Ann Arbor High School. D C. Heath & Co., Boston, New York and Chicago. 1889, XX+ 387 pp., 80 cents. This is not a text-book for pupils so much as a handbook for the teacher of physics. As such it will prove invaluable, especially if he has not had a practical training in physics in some of our more modern universities. Where Gage's Physics is used in our schools Chute's Practical Physics will be very often beneficially suggestive to the teacher. Where there is no good text-book it will be found still more useful. It will enable the untrained physical teacher to train himself in experimental manipulation. And that is a merit of no ordinary value.

Common School Song Reader, a Musical Reader for Schools of Mixed Grades, by W. S. Tilden, teacher of Music in the State Normal School, Framingham, Mass. Boston: Ginn & Company, publishers. 176 pp., 65 cents. The typography is as plain and beautiful as can be wished for; the instructions are ample and clear to the most satisfactory degree; and the musical exercises and selections appear to be very appropriate. It could scarcely be improved upon for use in our common schools unless it were in the tonic-sol-fa notation—the only notation which experience has generally proved to be readily mastered by young people and the masses.

Teachers' Manual of Geography, by Prof. J. W. Redway. Topics in Geography, by W. F. Nichols, A M. Publishers, D. C Heath & Co , Boston These are the latest contributions to geographical literature. In the first the author has shown us how fascinating the study may become if we take nature chiefly as the text-book. The work is highly interesting and the author punctures many statements and theories of current text-books on the subject. In Topics of Geography the author has arranged in convenient form suggestive model lessons for different grades.

Page's Choisies des Memoires du Duc de Saint-Simon, edited and annotated by A. N. Daell, Professor of Modern Languages, Massachusetts Institute of Technology. Boston: Ginn & Company, publishers, 1889. Pp. 236, 75 cents A most interesting picture of the life and times of Louis XIV., by one of the most powerful French writers.

The Pathfinder Series. The Pathfinder Series of Temperance Text Books, published by A. S Barnes & Co., New York, have been noticed before in these columns. They are three in number, finely illustrated, and written in an interesting style. For further particulars teachers may correspond with Mrs. R. H. Phillips, President of the W. C. T. U., Fredericton, N. B.

Introduction to the Study of Shakspeare, by Hiram Corson, LL D, Professor of English Literature in Cornell University. Boston: D. C. Heath & Co., publishers. The author indicates certain lines of Shakspearian study which he thinks will lead to a truer and juster appreciation of the plays. In his commentaries and notes he includes Romeo and Juliet, King John, Much Ado About Nothing, Hamlet, Macbeth, and Antony and Cleopatra. These commentaries furnish a careful analysis of each play, and we have also chapters on Shakspeare's verse, the Shakspeare-Bacon controversy, distinctive use of verse and prose in Shakspeare's plays, Latin and Anglo-Saxon elements The work throughout is keenly critical, and displays a wide knowledge of Shakspearian and English literature.

Milton's L'Allegro, &c, with introduction and notes by W. Bell, M A. London: MacMillan & Co, publishers. The poems comprised in the volume before us embrace L'Allegro, Il Penseroso, Arcades, Lycidas, sonnets, etc., all the English poetry written by Milton between 1630 and 1660. With the introduction and notes it forms a valuable addition to the student's library.

Ten Dialogues in Rhyme, for Primary Schools. Price, 15 cents Boston: Eastern Educational Bureau, publishers. These dialogues, bright and interesting, will be found admirably adapted for Friday afternoon exercises

Law of Childhood and other Papers, by Prof W. N. Hailmann. Published by Alice B. Stockham & Co., Chicago Postpaid, fifty cents. To comprehend aright the law of childhood as identical with the law of organic growth is the line of Prof Hailmann's thought in this book, which is characterized by a lucid presentation of sturdy opinions. His name is a sufficient guarantee that the spiritual meaning of life has not been overlooked.

The Child and Child Nature, by the Baroness Marenholtz Buelow Syracuse, N. Y.: C W. Bardeen, publisher. This book has for its object the promotion of a more thorough and universal understanding of the theories and philosophy on which Frœbel's educational system is based. It is valuable not only to the kindergarten teacher but to parents and to primary teachers

Shakspeare's Tempest, with introduction and notes by K. Deighton, B. A. London: MacMillan & Co,. and New York. This volume, a companion to others by the same editor, gives us in convenient form and with valuable critical notes one of Shakspeare's most admired plays.

RECEIVED.

The History of the Eastern Nations and Greece; Gradatim, — Easy Latin for beginners. Publishers, Ginn & Co., Boston.

Historical and Practical Politics, by Woodrow Wilson. Publishers, D. C. Heath & Co, Boston.

PUBLICATIONS RECEIVED.

The *Century* for November begins the twentieth year of this magazine, whose popularity is now world-wide. Several serial stories are begun, which promise to be of great interest. Mark Twain's contribution to this number, "A Connecticut Yankee in King Arthur's Court, is one of the most daring of the inventions of this most famous of American humorists. George Kennan has a chapter of "Adventures in Eastern Siberia."....*St. Nicholas* for November appears in larger and plainer type One of the cleverest things in the number is the short drama, "Sir Rat—A Comedy," written and illustrated by Oliver Herford....In *Wide Awake* for November, Mrs. White's Public School Cooking Series, in closing, tells how young women may get their training as teachers of school-cooking. The *Popular Science Monthly* for November has a portrait and sketch of Prof. Le Conte, of the University of California. ..The *Bookmart*, of Pittsburg, Pa., has a scholarly essay on an Octogenarian Poet Laureate....Among the many interesting articles in November *Forum* are "Modern Claims upon the Pulpit," by Archdeacon Farrar; "The Cost of Universities," by President David J. Hill; "Wendell Phillips as an Orator," and "The Domain of Romance." .. *Garden and Forest*, published by D. A. Munro, N. Y., grows more and more interesting every week The leading articles in the issue of November 6th, "The Utility of what makes Life Interesting," is a gem in its way. In the same number is a fine drawing and sketch of *Viburnum lantanoides*, one of our most beautiful shrubs....The *Scientific American* for November 9th gives drawings and sketches of the great Manchester Ship Canal. *Treasure Trove* for November has an exceedingly interesting table of contents....The Dalhousie *Gazette*, N B. University *Monthly*, Acadia *Athenæum*, Sackville *Argosy*, are all gladly welcomed after the long summer vacation....*Grip's Comic Almanac* — There are few people in Canada who do not see this entertaining annual It has just made its appearance for the eleventh year; and in many respects the new book is ahead of any predecessor The illustrations are abundant; and all of the contents are of a very amusing character. A new feature is the calendar of "Remarkable Events," which runs through the year, and which, alone, is worth far more than the price This book contains thirty-two pages, and sells at all bookstores at the old price, ten cents; or, send to publishers, Toronto, and receive the book, postpaid, by return mail.

The Educational Review.

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

IN wishing our readers A Merry Christmas and A Happy New Year we have to thank them very cordially for their hearty support of the REVIEW, and for the many encouraging words that have reached us during the past year. We trust that for our teachers the new year may see much that is encouraging and elevating in their work, and that our common schools may reach a much greater efficiency and excellence than hitherto. This progress it will be the aim of the REVIEW to help onward with all its power, and we trust that its increased excellence during the coming year will be an index of educational growth in the Atlantic Provinces.

WE call attention to the advertisement of Mr. Ganong's work on the "Mollusca of Acadia," in the present number.

THE School Commissioners of Halifax call for $90,800 for the coming year, which is an advance of $4,850 on last year. At the same time they have declined to accept the $1,000 per annum hitherto paid the Board, and have determined to serve without remuneration. Popular education in Halifax is rapidly extending, partly due, no doubt, to the growth of the city. The efficiency of the schools has been developing with remarkable activity. The organization is so perfect that at the monthly meetings of the Board the exact condition of attendance, work done, and the wants of each department for the previous month in the whole city is known. If the Commissioners have decided to work for nothing it is not because their work is light and unimportant. The sense of duty well done for the present and future advantage of the city appeared to be a better reward, we presume, than the acceptance of a sum of money inadequate to remunerate their services, yet bearing the implication.

WILL our exchanges and others please take notice of the change of address of the Nova Scotian editorship. EDUCATIONAL REVIEW, *Halifax, Nova Scotia*, instead of *Pictou*.

FREDERICTON is to be congratulated on having such a bright newspaper as the *Gleaner*, which has recently changed from a tri-weekly to a daily.

HALIFAX has at present very preeminent educational advantages. In addition to the public institutions so well known are many superior private schools. Opportunities are given every person. The Victoria Art School is filled with art students during the day, and in the evening persons engaged in business during the day are able to attend. The Medical College has just announced the following course of lectures, which will be free to the public:

> Lecture 1, Water in Relation to Sanitation; 2, Air; 3, Ventilation and Warming; 4, Drainage and removal of excreta; 5, Habitations and soil; 6, Food; 7, Beverages and condiments; 8, Exercise, clothing, climate; 9, Prevention of disease and disinfection; 10, Individual hygienic management and a summary.

They are being delivered by the President of the College, Dr. A. P. Reid, A. M., Superintendent of the Asylum for the Insane. The Y. M. C. A. also offers a most valuable course. Professor MacGregor delivered during the first two weeks of December two able lecturets on the "Circle of the Sciences" and "Facts and Fancies." Halifax should ere long give very evident signs of intellectual superiority among the greater cities of Canada.

THE Christmas vacation is approaching when the executives of our educational organizations will be laying the foundations for the convention work of next summer. Any suggestions should be sent in immediately to members of any such committees.

WE regret to learn that Inspector Lay, of Amherst, is seriously ill of typhoid fever, which is nearly epidemic in that town.

THE song and chorus by Mr. E. G. Nelson, of St. John—"Up with the Union Jack"—is a spirited and patriotic piece.

PROFESSOR BOIER, of Halifax, is meeting with great success in teaching German by the Berlitz system.

ST. JOHN CITY NIGHT SCHOOLS.

In the autumn of 1888, the School Board of the late City of Portland established three night schools, in which more than one hundred pupils were enrolled. Through the agency of these schools some very successful work was accomplished.

In the early part of last month schools of a similar character were organized in the Grammar School rooms. At the beginning three schools were opened, but owing to the demand for increased accommodation three others were almost immediately added.

The schools are conducted by male teachers other than those employed in day school work. The schools are open for two hours during four evenings of the week, and the enrolment is now nearly four hundred. The subjects taught are reading, spelling, writing, arithmetic, composition, and, in the more advanced departments, book-keeping, geography and English.

The central location of the schools allows of an almost perfect grading of the departments, and as a consequence much better results are secured.

Members of the School Board and other gentlemen are frequent visitors, and thus lend encouragement to the teachers and pupils in their work. It is but just to state that the very orderly character of the conduct of the schools is largely due to the careful supervision of the Secretary and Superintendent, who are regularly attendant at the schools.

Should the interest which has been manifest since the opening of the schools continue it might be worthy of the consideration of the Board of School Trustees whether the establishment of a permanent department in which business arithmetic, correspondence and kindred practical subjects may be taught to young men who are already engaged in the active duties of life but whose opportunities for acquiring such an education have been limited.

EDUCATIONAL REFORM.

It is customary with writers on education to review with complacency the work which has been accomplished in that department during the last half century, and there is good ground for their satisfaction. Though this period did not give birth to the agitation for national education its historian has to describe the progress of the discussion and narrate the steps by which it grew in strength and vehemence until the popular demand became the law of the land. He has to relate the incidents of the struggle which culminated in the expansion of the curricula of schools and colleges, the introduction of trained teachers and the establishment of institutions to equip them for their work, and the organization of departments to supervise, regulate and systematise the whole educational procedure. It is his duty, also, to note the adoption of better methods of instruction, a discipline more effective and humane, and a more elastic course of study, and to recognize the existence of a livelier interest, sympathy and vigilance on the part of the people at large. These are great reforms, and the philanthropist cannot fail to regard the prospect with pleasure when he sees that the influence of education is felt in every section of the community from the most densely peopled quarters of our towns to the remotest settlements in the backwoods.

Why then the expressions of impatience and dissatisfaction which we hear so frequently uttered respecting our education, and why is it that we can scarcely open a review or magazine which does not contain strictures upon the subjects of study and the way in which they are taught, upon the moral tendencies of our secular system, or its futility as an instrument for the preparation of the youth of the land for the business of life? Have not the schools in Britain and America, even the most conservative of them, bowed to the necessities of the time and modified their course of instruction to meet the demand for an education better suited to the needs of these modern days? Have these changes, then, disappointed the expectations of those who promoted them, or are the complaints which we hear and read the outcome of a hypercriticism, unreasonable, unjust and premature?

We purpose answering this question, and undertake to offer a few suggestions applicable to the education of these provinces, but equally so to the interests of education generally.

The aim of education is to prepare men and women to play their part faithfully and well in their various positions and relations in life. As individuals with personal responsibilities and duties, as members of society with its calls and obligations, and as citizens of a dominion, in the government of which each of them has to take an interest and a share, they can only acquit themselves to the extent of their powers when their minds have been duly disciplined, their characters moulded under the best influences, and their memories stored with the choicest thought and richest experience of past ages. It is true that the educator is of necessity compelled, in the first place, and chiefly, to remember that his pupils will have to go out into the world to earn a livelihood. His efforts must, therefore, be directed to that end. Time, energy and talent must be generously expended by him that his charge may be adequately provided with the mental equipment required for the various avocations which are open to them. But his highest conception of his duty ought not to be to send out from his school farmers, mechanics or tradesmen, but youths endowed with a disciplined intelligence, trained in habits of order, accuracy and observation, and with hearts responsive to the touch of generous emotions, and aglow with an enthusiasm for the good and the true.

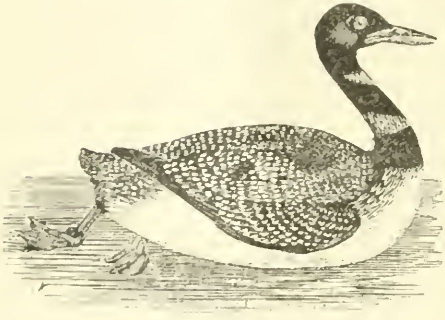
Were this ideal realized we would not be compelled to listen to so much unfavorable criticism of our education. But so long as the teacher holds his present relationship to his profession (if we may call it so), so long as he enters upon his duties without thorough preparation for their discharge, and performs them mechanically, without enthusiasm and without sympathy, we cannot expect that the results will be commensurate with our desires. We grant that there are many teachers doing good work, and that the normal schools are conducted with ability, fidelity and zeal, but the conditions under which they exist and operate are not favorable to the attainment of a high degree of excellence. The normal schools have to undertake the education of the student-teachers in studies which ought to have been completed at an earlier period of their career, and thus to devote time to ordinary school-work which could be more advantageously spent in professional training. An intermittent attendance at the district school, a term at the normal school and perhaps a year at one of the high schools or academies form, unquestionably, a very limited period in which to furnish one with all that is indispensable to such a vocation as that of the teacher.

But few of our teachers propose making it their profession. It is a business to which they betake themselves for the purpose of saving money and when that object is accomplished they abandon it forever. They only regard it as an easy means by which they may assist themselves in their ambition to become lawyers, doctors, ministers or merchants. Can they be expected, then, to exhibit a painful anxiety to make themselves accomplished teachers or to exhaust their energies in the schoolroom, when they know that their occupation is only temporary, and look forward with pleasure to the time when they can leave it? And yet we are free to confess that some of the best teaching, of which we have had experience, has been done under these circumstances. But these are not the conditions under which education can flourish. Frequent changes of teachers hastily prepared are not conducive to progress. Until steps are taken to render the teaching profession more permanent the same shortcomings will be observed, the same disinclination of able men to make it their life work.

And how is this feature of permanency to be secured? Only in one way, and that is by offering greater pecuniary inducement. The teaching profession must be able to compete, in its highest positions at any rate, with the other professions. Orators exhaust their vocabulary in extolling the advantages of education and magnifying the office of the teacher, and yet when the most distinguished in the profession are suppofed to be well paid for their labor their renumeration is far short of what is earned by inferior men in the other professions. We remember hearing an eminent public man say, respecting a large public school in which the discipline and teaching were very unsatisfactory, that "We ought to have at the head of this school an accomplished and scholarly man, a man of character and force, a man endowed with great magnetic power and gifted with high executive ability, whose influence would be felt in every class-room and whose word would be law to every pupil." There are men in the profession possessed of these attributes, men of singleness of heart and devotedness of aim, willing to spend and be spent in an occupation which they love and to which they lend lustre, but we question the justice of the opinion which regards such a man well paid by a salary of eight hundred dollars a year. But men who answer to the ideal head-master above described, do not, as a rule, remain in the profession, but carry their talents into a field where they can earn thousands instead of hundreds. And it is but right that the public should learn at once, as they must sooner or later, that the efficiency of their educational system depends upon the men and women who are the teachers under it, that the steady drain on them by other professions cripples effort and retards progress, that if the moral and intellectual advancement of our country is to be assured our best teachers must be induced to remain in the profession, and that these objects can only be attained by a more generous support of the teacher.

FERNDALE SCHOOL.

No. XXVIII.—Diving Swimmers.



The Loon. (*Urinator imber*. Gunn, No. 7 A. O. U.)

> The wild-fowl nestled in the brake.
> And sedges, brooding in their liquid bed.
>
> Byron—*Don Juan*, Canto XIII., St. 57.

T. Here we have a sketch of our common Loon, sometimes called the great Northern Diver. Do you notice anything peculiar about the position of its feet?

S. Its feet are very far back.

Jack. I guess if that bird tried to walk on land it would have to stand nearly upright, its feet are so near one end of the body.

Another S. It would appear to be walking on its tail nearly.

Jack. Tail! I think it must have been walking on its tail until it was worn off. It has only the rump left.

T. Not so bad Jack. The Greek for "rump" is *pyge*, the *g* sounded hard; and *podes*, you know, is Greek for—

S. Feet.

T. And all birds which have this character which you have noticed so well developed, are called by ornithologists the *Pygopodes*. What is the meaning of the term, will you please guess?

S. Rump-footed.

T. Correct. Which position would be most easy for these birds to maintain—the vertical one on land or the horizontal on water?

S. The horizontal on water.

T. You then see why the water should be their most natural home and why they should be so expert in all aquatic movements.

S. Do they dive?

Jack. The Loon will dive at the flash of a gun and be under water before the bullet can reach it.

T. Quite correct—especially if at long range. You can understand now why naturalists have called them diving birds. The position of their feet which causes them to move so akwardly on land is favorable to swimming and diving.

S. Are there many kinds of diving birds in these provinces?

T. About a dozen or fourteen. The following seven are the most common; Holbœll's Grebe, Pied-billed Grebe, Loon, Red-throated Loon, Puffin, Black Guillemot, and Murre. The following rarer: Horned Grebe, Razor-billed Auk, Dovekie, and Great Auk. Bounnich's Murre has been reported from Nova Scotia, and the Tufted Puffin and Large-billed Puffin from New Brunswick.

S. How can we distinguish the Loon from the others?

T. *First* the *Phygopodes* are divided into two sub-orders, those with *tail feathers wanting*, and *tail-feathers present but short*.

S. The Loon belongs to the latter.

T. Correct; the Grebes form the first sub-order. *Second*, the latter sub-order is divided into two divisions, those with the *hind toe present* and those with the *hind toe absent*.

S. The Loon belongs to the first of these.

T. Correct; those with the hind toe absent are the Auks, Puffins, Guillemots and Murres.

S. How large is the Loon?

T. From two and a half to three feet long, and weighs about sixteen pounds. Wing from thirteen to fifteen inches. Bill about three inches in length and one inch in depth at base. Eggs three and a half by two and a quarter inches, generally two, of a dirty white or stone color.

Astronomical Notes.

Our shortest day on Dec. 21, a total eclipse of the sun on Dec. 22, and our nearest approach to the sun on Jan. 2,—these are the chief astronomical fixtures for the next few weeks.

And the chiefest of these is the eclipse. Belcher's Almanac announces it thus: "A Total Eclipse of the Sun, Dec. 22, 1889. Visible at Halifax."

Visible at Halifax—let us see.

The total eclipse, caused by the sweeping over the earth of the moon's umbra or true shadow, will begin at 7.13 a. m. (60° time) in the Caribbean Sea to the south of Hayti. From there the shadow will sweep southeast along the coast of South America, just touching the land at a few favored spots. At several of these spots observing parties from England and the United States are waiting for it. One of the English parties, sent out by the government, is in charge of the Jesuit Father Perry. When clear of South America, the shadow will curve down and across the South Atlantic. Near St. Helena its direction will change to the north of east. It will strike Africa near St. Paul de Loanda, where there are other observing parties. Then it will sweep northeast across some of the darkest parts of the dark continent, and will leave the earth at 10.35, just after reaching the Indian Ocean. It will be a very respectable total eclipse, being over four minutes long at its best; but this will be in the middle of the Atlantic, and so will benefit nobody.

"Visible at Halifax" is certainly not true of this. Let us try the partial eclipse, caused by the moon's penumbra. That will be visible from Cape Breton to Chili, and from Florida to Arabia. A piece of the northwest corner of the penumbra will be swooping down on the earth just as Nova Scotia is swinging up into the morning sunshine, and it will select our province for its landing-place. This will give some parts of the province a chance to see a part of a partial eclipse. And that will be all. What the almanac should have said is that the eclipse will be partially visible at Halifax as a partial eclipse. And so it will to most of the province. But both the 'partial' and the 'partially' are very emphatic. In the north of Cape Breton and the west of Cumberland there will be no eclipse at all. Along the south coast from Halifax to Cape Sable there will be a small black patch on the lower right edge of the sun for five or six minutes after his disc is above the horizon. The nearer you are to a curve passing through Halifax and Cape Sable, the closer you will come to having that much of an eclipse. And the nearer you are to another curve passing through Baddeck, Pictou, Parrsboro, and along the North Mountain to Briar Island, the closer you will come to having none. At Yarmouth we may see a notch in the Sun's limb, 156° to the right of the vertex, for nearly two minutes after he is above the horizon, but it may be off in less than three-quarters of a minute. The *exact* time of sunrise at a given place on a given day can't be calculated beforehand.

These are very small eclipse favors, but they are the best we shall get from the sun until October, 1892.

The day before the eclipse, Saturday the 21st, is the day of the winter solstice. At 11 a. m. (60° time) the sun will reach his greatest southern declination, and, according to the almanacs, will enter Capricornus. If you could see the stars on that day while the sun is up you would find that he was in Sagittarius, a little west of the handle of the Milk Dipper, and just where you used to see Jupiter at the end of September. This you must take on faith. But don't squander your faith on things you may learn by sight. Such things, in connection with the winter solstice, are (1) that on that day the sun rises and sets to us farther south than on any other day of the year, (2) that at midday his altitude is less and the shadows he casts are longer than at any other midday, and (3) that the day is our shortest day. At Yarmouth, in the south of Nova Scotia, the length of the day will be 8 hours 54 minutes; at Dalhousie, in the north of New Brunswick, it will be thirty-two minutes shorter. At Yarmouth the meridian altitude of the sun will be $22\frac{3}{4}^{\circ}$, and the shadow of an upright ten-foot pole will be twenty-four feet long; at Dalhousie the altitude will be $18\frac{1}{2}^{\circ}$, and the pole's shadow thirty feet. At Yarmouth the points of rising and setting will be S. E. by E. and S. W. by W., at Dalhousie 3° farther south. At intermediate places these quantities will, of course, have intermediate values, If you know your latitude you can calculate the values for yourselves, or, better still, take a watch, a compass, a tape measure and a sextant, and get them by observation. Then wait a while and repeat the observation, and compare the two sets of results. But don't expect to find any appreciable difference close to the 21st. All the above quantities are then changing their values very slowly. In length of day, for instance, the 20th and 22nd will differ from the 21st by no more than two or three seconds. For a change of a foot in the length of the midday shadow of our pole, you will have to wait about a fortnight; and for a change of a degree in the sun's meridian altitude, a few days longer. For an increase of an hour in the length of the day, you will have to wait about six weeks; and three or four days more than that for a change of a point in the rising and setting positions of the sun.

Another quantity which reaches one of its extreme values on December 21st is twilight. We shall have ten minutes more of it at each end of that day than we had when it was shortest in October. (See notes in October REVIEW.) This will be its minor maximum (the major one falling at the summer solstice), and its total amount for morning and evening together will be three and a half hours at Yarmouth and three and three-quarter hours at Dalhousie.

And there is yet another quantity which has an extreme value on December 21,—the time that the sun takes to rise or set. This is only a small quantity at best, but it has its variations just like bigger quantities. For a given place it is least at the equinoxes and greatest at the solstices—the December maximum being a little bit the larger. Ask your friends who have not observed or calculated it how much they think it is, and you will likely get some rather wild guessing. I have had guesses all the way from two seconds to two hours. At Yarmouth the maximum is three and a half minutes and the minimum three. At Dalhousie these are four and three and a quarter minutes. At the poles it takes the sun thirty-three hours to rise and as long to set, but he can afford it there as he rises and sets only once a year. On the equator and at the equinoxes the time is least of all, being a little over two minutes.

We were at our greatest distance from the sun — or, as the almanacs say, the sun was in apogee — or, if you are a bigoted Copernicist, the earth was in aphelion — this year on July 1st. (See notes in July REVIEW.) We have been drawing nearer to the sun ever since, but there will be no perihelion for us this year. Never mind, next year we'll have two. The first of them will happen at 3 a. m. on January 2nd. We shall then be more than three millions of miles nearer the sun than we were on July 1st. There are people who find it hard to believe that we can be so much nearer the sun in midwinter than in midsummer. If this is your case, get a sextant and measure the sun's diameter at the beginning of January. Then wait until the 1st of July and measure it again. If you do it well, you will find that the January diameter is larger than the July one by nearly three and a half per cent. This should help your unbelief, unless you prefer to suppose that the sun swells up in winter and contracts again in summer.

The interval from one perihelion to the next is what astronomers call the anomalistic year. Its mean length is twenty-five minutes more than the tropical year, (the one generally used by mankind), but its actual length is variable. From the last perihelion to the one on January 2nd the interval is 366 days 15 hours; and from that one to the one on December 31, 1890, the interval will be 363 days 12 hours. At the coming one the earth will be 3000 miles nearer the sun than at the one in December last, and 1000 miles nearer than at the one in December next.

Mercury will be evening star from December 7 to January 29, at his best in January, especially from about the tenth to about the twentieth.

Venus is still morning star and will be so until February 18. Morning star-gazers may amuse themselves trying how near to that date they can see her, and then they will know how soon after that they may expect to see her in the evening.

Mars is brightening up for his opposition next year. He won't be visible before midnight until the end of March.

Jupiter is still visible for a little while after sunset, but the sun is gaining on him fast. They will be in conjunction on January 10, and after that our evening sky will know Jupiter no more for about five months.

Saturn is getting ready to fill Jupiter's place as evening star. In the middle of December he will rise about 10 p. m. (mean time), and about nine at the end of the month. He is now between five and six degrees east and south of Regulus, and is creeping very slowly eastward. He will stop that on December 15, when he will be less than two degrees north and a little west of Rho Leonis, a fourth magnitude star. Then he will move west again, back towards Regulus. If you have a glass that just showed his ring last spring you may find that it won't do it this winter. If so, don't break your glass, it is the ring that is to blame.

Uranus may be seen on the morning of December 24th about one degree south of Mars, both planets being near Spica.

Neptune became an evening star on November 25th. He was visible in the east before midnight a couple of months before that, but a planet is not considered an "evening star" until it is on the meridian before true midnight. In Neptune's case it is almost an abuse of language to call it an evening star at any time, for, as it is only about as bright as a ninth magnitude star, it can't be seen by the naked eye. But a field glass will show it, and an opera glass may, if it is a good one. If you would like to be able to say that you have seen Neptune, try the following prescription: First find Omega Tauri. Taurus has two Omegas, about two degrees apart. They lie about half way between Aldebaran and the Pleiads. The east one is of magnitude five and a half, the west one six. It is the west one you want. Point your glass at it and look for a small star close to it on the north-west side. If you can't see it, then your glass, your eye or the night is not good enough to see Neptune. If you can, then find Neptune from what follows: Previous to December 21 he will be south and a little east of Omega. On December 21 he will be directly south of it and about as far from it as the distance between Alcyone and Merope (the brightest Pleiad and the one nearest it). He will move west until February 10th, and will then be about three-quarters of a degree west and south of Omega. On April 1st he will be back under Omega again and nearer it than on December 21st. During these three months and more he will wander among the stars about as far as Jupiter does in five days at present, and as far as the moon usually does in about two hours and a half. A year from next February your glass will still show Neptune and Omega at the same time.

C.

Sketch of Prof. Ch. Fred. Hartt.

Few lives present a more inspiring example to the student than that of Prof. Charles Frederick Hartt, whose portrait is here given. In a short but brilliant scientific career he achieved results that are almost incredible, and that have made his name known throughout the world. And it was in our own rugged climate, amid the fostering influences of our own educational institutions, in a home where Christian principles were held as the most sacred trust, that those talents and capabilities that gained such signal triumphs were nurtured.

Prof. Hartt was born at Fredericton in 1840 and died at Rio Janeiro, Brazil, March, 1878. Shortly after his birth his family removed to Nova Scotia, and he was educated under the guidance of his father, Jarvis W. Hartt, then Principal at Horton Academy, and graduated from Acadia College at the age of twenty. He gave evidence in very early life of a fondness for natural science. Joined to a passionate love of nature, he possessed a careful and enquiring mind, and his persevering and accurate habits of study admirably fitted him for the minute and searching explorations which he afterwards undertook and so successfully accomplished. He possessed great versatility of talent. A language, music, drawing, were easily acquired by him. He attained such proficiency in Portuguese, the elements of which he learned from a shoemaker at Wolfville, N. S., that he lectured in this language to cultivated audiences in Rio Janeiro. The results of his keen observation and the original investigations which he carried on, even before he left college, brought him under the notice of Professor J. W. Dawson, who greatly encouraged him in his early scientific researches. Prof. Hartt was graduated from Acadia in June, 1860. In the same year he came to St. John, where his father established the High School, in which he was assisted by his son. But the geology of this region proved of such absorbing interest to him that his mind became restive under the routine work of a school. He afterwards made one of the best of teachers when he mastered his favorite study, —ever enthusiastic and thoroughly absorbed in science, his pupils everywhere, interested in the same pursuits, shared his deep and earnest enthusiasm. His passion for science never flagged from the moments when pausing by the roadside at the age of seven he broke open and gazed at the fragments of rock, until death laid its hand upon him in the midst of his life work in Brazil.

CHARLES FREDERICK HARTT, A.M.

It had been ascertained several years before Mr. Hartt came to St. John through the observations of Dr. Gesner, Prof. Robb and Mr. Matthew, that the series of Devonian Ledges on the Lancaster sea beach were fossiliferous, some plant remains having been found there by these gentlemen. These discoveries proved so interesting and valuable to science that Professor (now Sir Wm.) Dawson paid a visit to the locality; and the results of his examinations were shortly afterwards published.

In the summer of 1862 Mr. Hartt spent thirty days at the Fern Ledges, discovering many new species of plants, and more perfect specimens of those which had been previously collected. But a more valuable and unexpected discovery was that of the remains of insects—five species in all—the very oldest known to geologists, and which flitted about in the old Devonian forests perhaps hundreds of thousands of years ago.

A description of these insects from the pen of Prof. Scudder, the distinguished entomologist, may be found in Dawson's Acadian Geology, pp. 524–526. The first one discovered by Prof. Hartt was named *Lithentomum Harttii.*

After a course of study at Cambridge, Mass., under Prof. Agassiz, Prof. Hartt filled positions in several educational institutions in the United States, and was then appointed to the professorship of geology in Cornell University, New York. But it was in the extensive and distant empire of Brazil that Prof, Hartt was destined to achieve the greatest results of his energy and genius. In a series of five expeditions, covering thirteen years, he explored a great extent of country, examining much of it step by step, mapping out large districts of territory, accumulating a vast mass of geological material, publishing much that was new and valuable; and when the pen dropped from his hand he had prepared much of the MSS. of reports of his final work. The intense heat of the Brazilian summer, his failing health, caused by too close application to arduous and important duties, made him fall an easy prey to that dreadful scourge of the tropics—yellow fever. In the language of a very dear and intimate friend of his, Prof. Daniel S. Martin, he was "a Canadian by birth and education; an American by residence and adoption; a Brazilian, it may be said, by the chief labors and discoveries of his riper years; a scientist always and everywhere."

The results of Prof. Hartt's first and second expeditions to Brazil were published in a large octavo volume of 600 pages, entitled "The Geology and Physical Geography of Brazil," and is an illustration not only of the maturity to which he had brought his geological studies, but also of his great versatility of talent. The numerous maps and sketches by which the work is illustrated were drawn by himself, and the descriptive portions of the work are well written and interesting. Although his later trips yielded such rich scientific results, yet so carefully and accurately was the material of this book compiled that very little, if any, of it needed correction. Prof. Hartt had written before he went to Brazil in 1871 the following works: A quarto volume of 300 pages on "Brazilian Antiquities:" a work of 300 pages on the Mythology of Brazilian Indians; a grammar and dictionary of the language of the Tupe Indians, of about 400 pages. At the time of his death he had prepared voluminous reports as chief of the Brazilian survey. These, with his contributions to scientific journals throughout the country, show marvellous capacity and industry.

That he possessed all the qualities of a great leader and a brilliant scientific teacher is apparent from the abundant results of his comparatively short life. His industrious career furnishes a fruitful example of the rewards resulting from enthusiasm, energy and intelligence when applied steadily in one direction.

For the Review.]

N. S. Normal School.

The Truro Normal School has this year an enrollment of but one hundred, of whom fifty are in the first class. Thus, while the total number is the smallest for a long time, the first class is the largest but one ever enrolled in the history of the school.

This diminution of numbers exclusively in the lowest grades is due undoubtedly to the general advance in the facilities offered to students of this class by the county academies and other schools centrally situated. So long as professional training is not a condition of professional qualification so long the opportunities offered for obtaining professional training will not be an important factor in determining the choice of students who wish to select a school where they may prepare for the license examination. If good local facilities for preparation for the second class license are available candidates for this grade will not unlikely in diminishing numbers go a long distance to the Normal School.

So, too, it must be admitted that the relatively large class seeking qualification in the Normal School for the Grade B examination is indicative of a prevalent opinion that in the main better advantages are here offered in the lines of work requisite for that grade than can be obtained elsewhere. While nearly all of this year's first class are teachers of some experience holding a second class license, the indications are that their aims are principally for the literary advancement necessary to secure a higher grade of license, and only secondarily for the professional training which is given at the Normal School.

The principal of the school in his inaugural address dwelt particularly upon the urgent necessity of such changes in our present system which would not only secure on the part of every one entering the service a reasonable degree of professional knowledge and skill but at the same time relieve the Normal School of the heavy burden of purely academic work which under present circumstances, to its serious disadvantage as a professional school, the institution now has to carry.

His remarks on this head were emphasized by Superintendent Allison, who instituted an instructive and interesting comparison between the Nova Scotia and the Ontario systems as related to the question of licensing teachers. The latter system, though perhaps not to be imitated in all respects by us, was shown to be a rational one in that it required other training than that in merely academic studies of all would-be teachers; and differentiates the work of the Normal School entirely from that of the Academy and High School.

Two valuable donations have this year been made to the Normal School furnishings. Miss Ottie Smith, the art teacher, has executed in a most admirable manner a life-size crayon portrait of Dr. T. H. Rand and presented it to the institution. It now hangs in the Assembly Hall, a companion picture to the portrait of Dr. Forrester, presented last spring by Miss McLean, a former student of the school. The group of pioneers in Nova Scotia education will not be complete until some one adds to these two pictures one of Sir Wm. Dawson.

The other gift referred to as having been recently received is from Mrs. Captain O'Brien (*nee* Miss McDougall), an old-time Normal student, who has recently brought from India a magnificent stuffed crocodile and presented it to the school. Such manifestations of continued interest on the part of Normal School graduates are very gratifying, at the same time contributing in very important regards to the efficient equipment of the school.

Truro, N. S., Nov. 29, 1889.

Patriotism is not a sentiment of innate origin in the soul of man, but has its origin in the institution of nationhood, and follows a law of development in the individual in some way associated with the development of the nation to which we belong. A great national deed, a great national history, in course of time becomes a matter of pride to the people composing such a nation. . . . . Is such a sentiment strong among us? Not yet; but we are proud to say it is gaining in the hearts of our people daily. Thanks to our almost unrivalled educational system, the rising generation of our inhabitants, like those of the great neighboring republic, are becoming rapidly indoctrinated with patriotic teachings, and before the advent of the coming century our people will be as patriotic as those of any other country.—*The Weekly Monitor.*

Literature, the Sunshine of a Busy Life.

An Address by Dr. J. G. Fitch, of London, delivered before the Chautauqua Assembly, N. Y., in 1888.

I am right, I think, when venturing to address the members of the Chautauqua Assembly, in assuming that it is largely composed of men and women who are leading laborious lives, who are engaged in various occupations and professions, but who are nevertheless conscious of the need of self-improvement and the desire to avail themselves of some of the manifold resources of this great Assembly in order to add to their own knowledge, to gather fresh ideas, to enlarge the sphere of their own reflection, and in particular to acquaint themselves with some of the best thoughts which have been accumulating from time to time and garnered in the great storehouse of English literature.

Many among you, I know, feel that a life wholly devoted to the study and manipulation of material things or to the business of money-getting is an incomplete life; that any one study or pursuit practised to the exclusion of all others has an inevitable tendency to narrow and pervert the mind; and that there is the need of some other intellectual interests than those immediately and visibly connected with the proper work of your profession, to keep your mind and character duly balanced and to help you to see your special work in its true proportion.

I cannot express to you too strongly my own sense of the wisdom of this resolve of yours. There are duties of being as well as of doing, duties to ourselves and to our own faculties as well as to our own profession and to the world in which we live; and be assured that those who are conscious of the possession of tastes which transcend the boundaries of their daily avocations would sin if they did not afford to those tastes some scope for development. We have not only to get a living but to live. And the life we live depends on the tastes we form, on the things we enjoy and like, on the pursuits of our leisure as well as on our diligence in our special calling. We are not to suppose that there is anything incompatible between the duties of the most absorbing profession and the cultivation of tastes outside of that profession. We have in England at this moment a prime minister who is known to be in his hours of relaxation devoted to the study of experimental science. We had until lately another prime minister who has found a solace for his leisure hours in the study of the oldest Greek poems, and in the investigation of problems respecting the state of man and society in the twilight of the Homeric age. Very lately one of the ablest and most laborious of our judges has produced a scholarly translation of Virgil. Shall we complain in all these cases that men of such eminence concern themselves with speculations and studies apparently remote from the pressing duties of their public life? Or shall we not rather recognize that those very duties are likely to be all the better fulfilled because those who undertake them have sought to widen the range of their intellectual interests and so to see the special work of their lives in relation to the larger world of thought and action, and of human history, of which even politics and jurisprudence form a part?

And, you too, however absorbing and interesting your special studies and the professions to which they lead may prove to be, have also leisure to fill, homes to cheer, influence to exert among those whom you love and with whom you come in daily contact. And more than this, you have the world of your own thoughts and fancies and hopes and pleasures, and you know well that this world will be enriched and ennobled in just the proportion with which you store it with truth, that,

> " He that made us with such large discourse,
> Looking before and after, gave us not
> That capability and God-like nature
> To rust in us unused."

Now, of literature it may be said that in one sense it is a picture and in another a criticism of human life. The student of literature comes in contact not merely with this or that particular branch of knowledge, but with the relation of knowledge to the entire conduct and aims of life. Of course by literature I do not mean all books. A manual of electricity, a text-book of history, a cyclopedia, may be very valuable and, indeed, indispensable in your library, but it is not literature.

So long as the book deals with the acts of its own subject and confines itself to those facts, it does not come into the catalogue of literature at all. Yet a book of science or of history or philosophy may become entitled to this rank on one of two conditions. It may by the breadth and skill with which it is treated show the relation of its own subject to other departments af human knowledge and to the whole science of life. And then it is lifted above the rank of a manual or a book of information up to the higher dignity of a work of literary art. So I should not call Whateley's Logic literature, because, able as it is, it is not much more than a compendium of rules and *formulæ*. But I should call John Stuart Mill's Logic literature because it discusses the principles which underlie the rules of formal reasoning, and traces out the relations of the rules to those principles. Or a book may become entitled to a permanent place in English literature whatever be its subject if there be a certain charm, or finish, or beauty in its style. A slipshod, ill written and tawdry story may not deserve to be called literature, even though the story itself is full of incident and interest. But the " Vicar of Wakefield " is literature, notwithstanding its gross improbabilities, and the confusion and incoherence of the plot, because of a certain grace and sweetness, and because of a delicate perception of human character which Johnson detected in ten minutes glance at the manuscript, but which subsequent readers have fortunately been able to recognize at their leisure.

Many of you are familiar with the notion of the storage of electrical force. And you may regard a great library too as a store of the force which has helped to shape the mind of humanity and is still shaping it, and likely to influence it in the time to come. Books are the product of the best thoughts, the loftiest hopes, the brightest dreams of mankind, they represent the outcome of all controversies, the history of human error, the progress of truth. No man born into a world so rich in thought and in experience has a right to live in it who does not learn something about it and feel stirred with a desire to know more.

There is no more attractive form of literature to many minds than biography. "Man," says Carlyle, "is perennially interesting to man, nay, if we look strictly to it there is nothing else interesting. How inexpressibly comfortable to know our fellow creature, to see into him, understand his goings forth, decipher the whole heart of his mystery, nay, not only to see into him, but even to see out of him, to view the world altogether as he views it so that we can theoretically construe him, and do now thoroughly discuss both what manner of man he is and what manner of thing he has got to work and live on." It must not be supposed that all biographers, so-called, fulfil these conditions. Many a book called the life of a hero or of a statesman is nothing but a dry chronicle of dates, of his parentage, the public offices he filled, and his outward and visible acts. But a true biographer requires not only the knowledge of these things, but insight into character, power to discriminate between relevant and irrelevant, significant and insignificant detail; and to present to you a vivid picture of the struggles, the successes, the fortunes and the work of a life. And it matters little what the position or circumstances of the subject of the biography may be, so long as the story is truthfully told, with sympathy and with discernment, the result is sure to be valuable. There was an old Greek who settled in Rome in the first century and who was greatly interested in observing a sort of parallelism between the lives of some of the Greek heroes and the career of some of the later Roman soldiers and statesmen. His name was Plutarch and he wrote a series of biographies. Fortunately a translation of this work into English happened to appear at the moment when Shakspere was in the fulness of his vigor and literary activity; and the book profoundly interested him. Out of it he procured the material of his most famous plays, the Roman dramas of Julius Cæsar, Antony and Coriolanus. Since that time there have been many biographies in our own language; but those which have taken an abiding place in literature may soon be enumerated: there are Izaak Walton's charming lives of Hooker and Herbert, Boswell's Johnson, Johnson's own Life of the Poets, Southey's Bunyan and Nelson, Carlyle's Life of Sterling, Stanley's Life of Arnold, Mr. Eliot Cabot's Life of Emerson, Sir O. Trevelyan's of his uncle, Lord Macaulay, and a few others. Some of you will perhaps be attracted by Smile's book, the Lives of Engineers, because the careers of those men resemble that which many young and ambitious men would like to follow. That is natural enough. But Smile's only heroes are the successful men. His stories are marred a little by his constant insistence on what has been called the "great gospel of getting on." Now, "getting on" is, of course, one of the legitimate aims of life. But it is not the only thing worth studying. You read biography that you may understand human nature better; that you may find some light and guidance in understanding the great problem, how far can a man control circumstances, and how far do circumstances control him. You want from such reading to obtain self-knowledge, renewed fortitude and prudence in encountering the struggles of life. And I am not sure that the lives of unsuccessful men are not from this point of view the most instructive of all. To me there is profounder interest in tracing the wayward, unhappy life of Richard Savage --his queer alternations of splendor and squalor, his genius and his misery, as told by Johnson, than in many a story of a hero or a saint.

Closely connected with biography is history, which is in one sense a compendium of biographies. And here again you have to distinguish between the history which is mere chronicle or narrative, and the history which is that and something more, and which thus becomes entitled to an enduring place in literature. You have had easy gossipy chroniclers, like Herodotus, Froissart, or Geoffrey of Monmouth, who have simply set down all the stories they have heard, without inquiring too anxiously into their authenticity or their truth. Then you have had other more critical historians such as Thucydides, Livy, Robertson, Hume, Clarendon, Burnet, Lord Stanhope, Motley, and Francis Parkman, who have taken pains to sift evidence and to present the truth of fact; and have sought "to show the age and body of the time, his form and pressure," but have aimed at little more. In a third class of historians, whose works are illuminated by grace and style, or by the skill and power with which the whole subject has been handled, we have Tacitus, Gibbon, Macaulay, Froude and Carlyle, and in every one of these writings your interest is not merely objective in the actual picture of the events as they happened, but largely subjective, because it is just as edifying for us to know in what light events have appeared to a man of genius, and what impression they made upon him, as it is for us to know the bare truth that such and such a battle was fought or a law passed or a treaty concluded in a particular year. Finally we have a small group of historians who are to be regarded rather as students of human nature and philosophers than as mere story tellers, who have tried to trace out the laws and the principles which have controlled, and may help to explain the march of events and the development of human institutions. Bolingbroke wrote a book called the Philosophy of History, which was better in aim than in execution; but in our own time the remarkable fragment which Buckle lived to complete of the history of civilization, and the works of Mr. Lecky, especially his history of European morals, are examples of a kind of literature which will always have a special attraction for those among you who care to know not only what has happened in the world, but as far as possible why it has happened, and what have been the causes of an event, its consequences and its moral significance, and what light it throws on the government and the future destiny of the world.

Indeed, to a large class of minds, and that by no means the least powerful and the least fruitful, truth of principle will always seem more important than truth of fact; they are led by special taste and aptitude to care more about the reason and the laws which underlie the facts of life than about what is called information in any shape. They value the knowledge of matters which belong to the region of outward experience, only in so far as they shed light upon the deeper truths of inward experience; and on the explanation of man's nature his powers, his faculties, and his relation to what is unseen. To minds of this stamp these questions, "What am I, why am I here, whence arose the power which I possess, how may this power best be strengthened, what use should I make of it, what is the ultimate test of right and wrong, of true and false, what is the true nature of human duty?" will always appear to be of supreme importance.

It is not the only business of an intelligent life to arrive at conclusions, nicely cut and dried, thoroughly verified and warranted fit for immediate application. It is also an essential part of its business to lay hold of the instruments of reasoning, and to learn how to use these for one's self. And if any one of you is conscious of a taste for philosophical inquiry, a deeper interest in the processes by which truth is arrived at, than in the achieved results of other people's enquiries and researches, do not be afraid, in your leisure, of indulging this taste, and don't be deterred from such indulgence because you are told that philosophy is unpractical. Nothing is unpractical which makes you feel intellectually richer and stronger, which interests you strongly, which sets you thinking, and which sends you back to your daily duty refreshed and strengthened, as after a bath or a holiday.

(To be continued.)

Why Sixty Seconds Make a Minute.

Why is our hour divided into sixty minutes, each minute into sixty seconds, etc. Simply and solely because in Babylon there existed by the side of the decimal system of notation another system, the sexagesimal, which counted by sixties. Why that number should have been chosen is clear enough, and it speaks well for the practical sense of those ancient Babylonian merchants. There is no number which has so many divisors as sixty. The Babylonians divided the sun's daily journeys into twenty-four parasangs, or 710 stadia. Each parasang or hour was subdivided into sixty minutes.

A parasang is about a German mile, and Babylonian astronomers compared the progress made by the sun during one hour at the time of the equinox to the progress made by a good walker during the same time, both accomplishing one parasang. The whole course of the sun during the twenty-four equinoctical hours was fixed at twenty-four parasangs, or 720 stadia, or 360 degrees. This system was handed on to the Greeks, and Hipparchus, the Greek philosopher, who lived about 150 B. C., introduced the Babylonian hour into Europe.

Ptolemy, who wrote about 140 A. D., and whose name still lives in that of the Ptolemaic system of astronomy, gave still wider currency to the Babylonian way of reckoning time. It was carried along on the quiet stream of traditional knowledge through the Middle Ages, and, strange to say, it sailed down safely over the Niagara of the French Revolution. For the French, when revolutionizing weights, measures, coins and dates, and subjecting all to the decimal system of reckoning, were induced by some unexplained motive to respect our clocks and watches, and allowed our dials to remain sexagesimal, that is Babylonian, each hour consisting of sixty minutes.

Here you see again the wonderful coherence of the world, and how what we call knowledge is the result of an unbroken tradition of a teaching descended from father to son. Not more than about a hundred arms would reach from us up to the palaces of Babylon, and enable us to shake hands with the founders of the oldest pyramids, and to thank them for what they have done for us.—*Max Muller, in the Fortnightly Review.*

Greek is very beautiful; Greek grammar is perfect. We would heartily encourage our young men to gain some acquaintance with the language and its grammar. Of course, a man may be a great lawyer, an eloquent preacher, a profound thinker, a true poet without either Greek or Latin. But culture is desirable; and as instruments of mental culture Greek and Latin are invaluable.

Pluck and Cricket.

Wellington said that Waterloo was won on the field of Eton. He referred to the gallantry of his officers, many of whom had been trained by the games and sports of that famous school. An illustration of the effect of such training in developing a man's limbs and wind was given at Inkerman, one of the most stubbornly fought battles of the Crimean war.

A young officer, who had learned at Eton not much from books but a good deal from its sports, had hot work on that eventful night. His sergeant fell at his side. Seizing the dead man's rifle he fired it, emptied his own revolver, drove his sword through a Russian officer, but was surprised by being surrounded and made prisoner.

While going to the rear in charge of two stalwart Russians, he looked at their long coats and said to himself, "They can't run."

Watching his opportunity, he knocked one soldier heels over head, threw the other by a wrestler's trick into the mud, and took to his heels. Before his guardians were on their legs and could fire, he had got over a good piece of ground.

A Russian lancer made at him; he ran as if leading an Eton foot race, and cleared a good-sized fence. The lancer cleared it after him, and with lance fixed pressed the fugitive hard.

A swollen brook, running fiercely, barred his way. It was seventeen feet wide, but the old Etonian had won the long jump when at school, having cleared nineteen feet over Calvary ditch. He now jumped the brook; the lancer refused to follow, and the young officer ran back into the English lines.

"Hurrah for Eton!" he shouted as a school-fellow shook his hand recalling the school where he had learned to shoot, to fence, the art of boxing, the wrestling dodge, the high jump, the long jump and the use of his legs.

A Hard Worker.

Sir Walter Scott's career illustrates the value of hard work, even of drudgery, in early life as a preparation for activity and productiveness when the powers are matured. Scott had an aversion to the mechanical act of writing. His apprenticeship at the law helped him to overcome the aversion, for he was obliged day after day to copy dry law papers.

The drudgery of copying declarations, pleas, replications, rejoinders and surrejoinders, rebutters and surreburters, made him facile in the use of the pen, and cultivated the dogged patience which no labor could irritate. He himself tells us that once during his apprenticeship he wrote one hundred and fifty folio pages without an interval for food or rest.

When he became an author, the habits formed during his apprenticeship enabled him to turn out an amount of work, year after year, which seems almost incredible. The author of "Walter Scott at Work," published in *Scribner's*, says:

"In the year 1814 alone he wrote nearly the whole of the 'Life of Swift,' the second and third volumes of 'Waverley,' 'The Lord of the Isles,' two essays for the supplement to the 'Encyclopœdia Britannica,' the introduction and notes to the 'Memorie of the Somervilles,' annotations to a reprint of 'Rowland's Letting Off the Humors of Blood in the Head Vein,' 1611, and kept up an unstinted correspondence with his friends; and all this literary activity was interrupted by a two months' voyages to the Hebrides, and by constant attention to the financial perplexities of the Ballantyne press and publishing house."

Will, energy, patience, method, and an industry which never permitted him "to do nothing" enabled him to write "Guy Mannering" in six weeks, the second and third volumes of "Waverley" in twenty-four days, and the first volume of "Woodstock" in fifteen days.

He did not wait for "inspiration," nor did he idle away the time between "inspirations." Before breakfast one morning he finished "Anne of Gierstein;" after breakfast he began his compendium of Scottish history.

The greater part of "Ivanhoe" and of "The Bride of Lammermoor" was dictated during an illness, the pains of which set him "roaring like a bull-calf." Laidlaw, his amanuensis, begged him to stop dictating.

"Nay, Willie," replied the sick man, "only see that the doors are fast. I would fain keep all the cry as all the wool to ourselves; but as to giving over work, that can only be done when I am in woollon."

Effect of Tobacco Upon Boys.

An experimental observation of thirty-eight boys of all classes of society and of average health, who have been using tobacco for periods ranging from two months to two years, has recently been recorded by *Science*. Twenty-seven showed injury to the constitution and insufficient growth; thirty-two showed the existence of irregularities in the heart's action, disordered stomach, cough, and a craving for alcohol; thirteen had intermittency of the pulse, and one had consumption. After they had abandoned the use of tobacco, within six months' time one-half were free from all their former symptoms, and the remainder had recovered by the end of the year.—*Boston Herald.*

Modelling in Clay.

The outfit for modelling is very simple,—an earthen jar, a mass of clay, a case-knife or a piece of wire or cord. The clay should be kept moist in the jar by spreading a wet cloth over it. When it is needed for class-work, take out on a clean board a mass containing about as many cubic inches as there are children in the class.

Holding the cord well stretched from left to right, cut the mass from top to bottom, beginning about an inch from the further side. Repeat this cutting at intervals of about an inch. Then turning the cord from back to front, cut in a similar way from top to bottom. Without breaking the mass apart, turn it over on its further face. Holding the cord from left to right, cut again as before, thus dividing the mass into pieces about an inch in diameter. These can be quickly distributed, by placing a small piece of clay on the slate of each child, or upon oblongs of enamelled leather provided for the purpose for each child. The children are then ready for the lesson.

When the lesson is completed, the forms modelled should be gathered on a slate and taken to the teacher's desk. From the forms modelled select those which are worthy of preservation.

The remainder of the clay should be put together, moistened, and wedged (thrown on a hard surface until it becomes one mass again) that it may be ready for use at another lesson.

The two processes in modelling the type-forms are rolling for round and curved faces, and flattening for plane faces. The clay may be rolled between the palms of the hands for round faces, and upon a plane surface for curved faces. It may be flattened by gently striking it either upon a plane surface or with something having a plane surface.

In modelling any form however, whether it is a type form or an object, the fingers may be used whenever necessary. In modelling objects, it will be necessary to use the fingers to obtain the irregularities of form. The fingers should be used in preference to any tool; and in no case should a sharp tool be used. Remember that scratching and cutting cannot be called modelling.

Model each type-form. In your endeavor to express your idea of the type-form, you will find that idea growing more clear and definite and that while you are modelling the form in clay, you are also modelling your mental image of that type-form.

After modelling a type-form, look for an object based on that form. Do not take any object that may be near at hand, but try to find an object that is representative of its kind, well proportioned and beautiful. For instance, if you have been modelling a sphere and have decided to model an apple as an object based on a sphere, do not be satisfied with a defective, poorly developed, extremely one-sided apple. Find one that is fresh and firm and pleasant to look upon and that brings to your mind all the goodness and pleasure that my lie in an apple. Seek one beautiful in form, but do not make the mistake of looking for one that is perfectly symmetrical; such an one will probably appear more like a ball than an apple. Having selected your object, study it with care, and while modelling, examine it frequently, not only by looking at it, but also by passing the fingers over it. Do not attempt to model without an object. After modelling the ellipsoid and ovoid, and objects based on these type-forms, it will be well to take leaves that are elliptical or oval in outline. Never model from pressed leaves. Select as far as possible leaves with entire margins.

Place a freshly gathered leaf on the table. Notice that it does not lie flat on the table. Frequently one side will be much higher than the other, and there will be undulations of surface here and there.

Having prepared a tablet of clay of suitable size for the leaf, build up the leaf on this tablet. If the natural leaf is higher on one side than the other, build up the clay on the tablet to make your modelled leaf like the natural leaf. Study the variations of surface carefully and endeavor to produce them. Do not endeavor to reproduce all the veins (in many cases the midrib will be sufficient), and never scratch in the veins.

Directions for a class exercise follow, to show the method of carrying on the work of modelling in a school-room.

For modelling, we have the models, and the clay divided into small pieces, ready for distribution. Take a piece of clay, and, holding it carefully between the two palms, roll it gently and skilfully. Turn the fingers backward, that the palms may be as flat as possible, and roll lightly and rapidly. Let the children watch the motion, notice how the hands and fingers are held, how the clay is rolled until it becomes a beautiful sphere, round and smooth. Lay the ball where all can see it, and distribute the models and the clay. Then, taking another piece of clay and rolling it, tell the children they may try to make round, smooth, beautiful spheres of their clay. The little hands take the clay and roll it as well as they can; little fingers turn back in imitation of the teacher; the masses become rounder and smoother. At a given signal let the children place their spheres upon their slates. The spheres will not be all round, to be sure, but they will be better next time. Little hands are soft and supple and are easily trained.

Question the children as to what they have made, and have them compare their spheres and the model spheres by taking one in each hand and telling about them.—*Mrs. Mary D. Hicks in N. Y. School Bulletin.*

Reading vs. Elocution.

This story was told me by Mr. John J. Hayes, the accomplished teacher of reading at Harvard College. One day a young girl came to him to take some lessons in reading. She had been told that she had talent and would make her mark as an "elocutionist"—how I dislike that word! Mr. Hayes asked her to read something, and she undertook to recite a poem. She gave no meaning to the lines, but she had a great many gestures; she raised her eyes and her shoulders, and did a great many things that were supposably dramatic, but which were particularly inappropriate to the descriptive poem she was reciting. After she had finished Mr. Hayes said:

"What do you suppose was the poet's thought when he wrote this:

> 'O, Freedom! thou art not as poets dream,
> A fair young girl, with light and delicate limbs;
> A bearded man, armed to the teeth, art thou.'"

A blank look came into the girl's face. "I don't think I know what you mean."

"Why, what do you think the poet meant by these lines?"

"I don't know: I never learned that," was the hesitating reply.

"Yet you tell me you have studied it," said Mr. Hayes.

"Why, yes, I have spent a great deal of time on it, and my teacher marked it for me."

"Let me see it," and Mr. Hayes held out his hand for the book which was put into it with an air of the greatest assurance, as though it was to settle every question of her "study,"

And what do you suppose the "notes" were? Simply these: "right hand extended," "weight forward on the left foot," "raise the eyes," "both hands in appeal," and so on. Not a suggestion about the expression, but all meaningless action—as so many are taught who seem to consider elocution "so far ahead of reading."

The great danger has been, in this late craze, that the world would lose its readers in the flood of elocutionists that are being poured out of the hands of teachers of that terribly overworked "art." In former times it was considered a great accomplishment to read well; that is to read understandingly, behaving in the meantime like a lady or gentleman, and not like a spasmodic marionette whose wires are out of order, and only work by jerks. It is the reading with the understanding that is taught to the little folks I have been telling of, and it is a kind of teaching that will give its results all through a pupil's life. —*Sallie Joy White, in June Wide Awake.*

EDUCATIONAL OPINION.

The memorizing of the technicalities of a course of study, says the *New York School Journal*, is not mastering the subjects presented. No teacher can be found who will say that this statement is false. Yet, when we examine much of the work that is done in our schools, we find that a good portion of time is taken up in the memorizing of technical subjects, in text-book work, in the reaping of rules and phrases. Another difficulty in connection with our present system of instruction is a straining at what may be called accuracy. We should not underestimate truthfulness and accuracy of statement, but it is impossible for children to exhaust any subject, however small that subject may be. The unthinking examiner says to the teacher of primary pupils, "Do not leave this subject until your pupils know all about it; be absolutely thorough in what you teach. If it takes a year for them to master this principle, take a year. The time will be well spent." But this is wrong. It is not until the mind grows so that it can reason, comprehend, and generalise, that it arrives at any good degree of accuracy and thoroughness. It is by no means necessary that a child should know all about North America before he studies South America. He may know a little about the whole world, and superficially; but, by and by, the little he learns grows greater until after a few years his knowledge of the world becomes extensive and comprehensive: and when his powers of mind are so developed as to enable him to generalise, he then is able to be minute and accurate, as well as gain a comprehensive understanding of the whole subject. The principal thing to be aimed at in the education of young children is to keep them thinking about those things that will develop their brains. It needs to be said over and over again, that the number of facts learned is unimportant compared with the training pupils get that will lead them to take a deep interest in the subjects before them, and think with some degree of accuracy concerning what is given them to study. The all-important requisite, in any course of study, is interest in things profitable.

Grammar is *not* taught in our public schools. The child who escapes from school with a tolerable knowledge of the English language does so in spite of his training not because of it, or he owes his good fortune to the fact that his teacher has defied the prevailing system and burned the prescribed text-book.—*Truro Guardian.*

A LIVELY discussion at a recent meeting of the Woodstock (Ont.) School Board brought out the fact that the Board has been in the habit of making appointments to the teaching staffs of the schools without consulting the Principal. Principal Garvin was quite right in pointing out that this is wrong and unfair. It is surprising that any Board should think of making an appointment to any subordinate position save with the full knowledge and consent of the man who is responsible for the efficiency of the work done. All such appointments should be made, as far as practicable, upon the recommendation of the Principal, and it should be made clear, too, that with him rests virtually the power of dismissal. If the Principal is held responsible, as he should be, for the work and conduct of the school, it is but reasonable that he should have the authority necessary to enable him to carry the responsibility.—*Toronto Educational Journal.*

BOOK REVIEWS.

ABORIGINAL REMAINS OF NOVA SCOTIA, illustrated by the Provincial Museum Collection, Halifax, by Harry Piers. This with a paper on a "parasitic fungus on the larva of a May beetle" is a reprint from the transactions of the Nova Scotia Institute of Natural Science. The above paper is quite valuable and is illustrated by a plate of excellent drawing by the author.

ANCIENT HISTORY FOR COLLEGES AND HIGH SCHOOLS, by William F. Allen and P. V. N. Myers. Part I., The Eastern Nations and Greece, by P. V. N. Myers. Ginn & Co., Boston, U. S. This volume more nearly realizes our ideal of a text-book of history than any other one that we are acquainted with. The narrative is lively, lucid and condensed. The tables and chronological summaries are useful and convenient, the illustrations are well executed and instructive, while the maps, indispensable in such a work, are well drawn, accurate and distinct. The materials are abundant, but only such as are necessary to produce a clear and effective presentation of the incidents of the history. The social and political condition of Egypt, Babylonia, Assyria, Persia and Greece, their laws, philosophy, arts and religion are discussed with commendable brevity and judgment. Nothing, in our opinion, can be more injudicious than the overloading of text-books of history with ill selected facts. They may be useful for examination purposes, but they are dreary, dry and dull. But this book both attracts and stimulates There is a skill in the arrangement of the materials, a charm in the style and a picturesqueness in the delineation of character and the narrative of events that cannot fail to secure for it the approbation of teachers and students. And it deserves to be read, not simply as a class-book, but as a highly interesting account of the early civilizations, and one which, while scholarly, accurate, and abreast of the most recent discoveries in the East, is suggestive of much that is beyond its scope, and naturally leads up to the study of the great works of Grote and Rawlinson. To arouse and quicken the interest of his students in historical studies is one of the duties of the teacher, and we know of no book better suited to assist him in the accomplishment of this object than this history of the Eastern Nations and Greece.

"GRADATIM," an easy Latin translation book for beginners, by H R. Heatley and H. N Kingdon. Revised for American Schools by W. C. Collar. Ginn & Co., Boston, U S. For young pupils and for older ones who can spare the time, this book will be an easy and useful introduction to Latin translation. It will serve the important purpose, at this early stage of familiarising the beginner with the Latin idiom, make him master of a fair vocabulary and assist him to overcome the strangeness, both in form and sound, which in many instances proves a serious obstacle to the progress of the young translator. The anecdotes, interesting and sometimes amusing, are well selected and fitted to stimulate and encourage the learner. Since the exercises are carefully constructed and their Latinity pure and simple, they may, in the hands of a good teacher, be made available as a basis for retranslation. We do not doubt that this Reader will become popular with teachers and pupils, as soon as it is tried and its merits fairly tested.

ELEMENTARY MATHEMATICAL TABLES, by Alexander Macfarlane, D. Sc., LL. D., Professor of Physics in the University of Texas Boston, U. S. A., and London: Ginn & Company, 1889. This is an octavo of 105 pages of superior typographical excellence, specially designed to lead the eye instantaneously to the proper spot. They are also specially adapted to arithmetical work and the illustration of the theorems of algebra. It contains thirty-one different tables; such, for instance, as: I. Common Logarithms; II, Anti-logarithms; III, Addition Logarithms; IV, Subtraction Logarithms; V, Log., Sines and Cosines; VI, Log., Tan. and Cot.; IX, Nat. Sines and Cosines; X, Nat. Tan. and Cot ; XI Nat. Sec. and Cosec.; XII, Radius; XIII, Reciprocals. Also squares, cubes, square roots, cube roots, multiples, circ. of circle, area, sphere, hyperbolic logarithms, comp int. amts., present values, annuity tables, least divisions, exponentials, etc. A capital book for the teacher's desk.

THE STATE ELEMENTS OF HISTORICAL AND PRACTICAL POLITICS, by Woodrow Wilson. D. C Heath & Co , Boston, publishers This is a complete text-book of comparative political science in about 700 pp. It begins with an account of the probable origin of government in the patriarchal idea, noticing *en passant* the theories of a State founded by contract, by an original law giver, or by Divine direction only to pass them by as inadequately proven. It next describes at length the state machinery of the chief Aryan nations—Greece, Rome, the mediæval Teutonic governments, most of the modern nations of Europe, and our own republican neighbors, dealing in close detail with Britain and her colonies, the United States, France—both before and since the revolution—Germany and Switzerland, and tracing with great care the mutual relations of Germany and Prussia, as also those of the dual monarchies of Austro-Hungary and Scandinavia. The palm in statesmanship is thus awarded to Rome among ancient and Britain among modern communities:

"In this history of development two nations stand forth preeminent for their political capacity – the Roman nation, which welded the whole ancient world together under one great organic system of government, and which has given to the modern world the groundwork of its systems of law, and the English nation, which gave birth to America, which has 'dotted over the whole surface of the globe with her possessions and military posts,' and from which all the great nations of our time have borrowed much of their political thought and more of their political practice. And what is most noteworthy is this, that these two nations closely resemble each other not only in the mental peculiarities which constitute the chief element of their political strength, but also in the institutional foundations which they have laid for their political achievements. Both have been much stronger in creating and working institutions than in explaining them; both of them have framed such a philosophy as they chose to entertain 'after the fact. Neither has been too curious in examining the causes of its success, or in working out logical sequences of practice."

The book closes with a full analytical summary of the subject, and would prove an invaluable aid to the teacher or student of this important department of social science.

RECEIVED.

MANUAL OF EMPIRICAL PSYCHOLOGY; NATURAL HISTORY OBJECT LESSONS. D. C. Heath & Co., Boston.

SHAKESPEARE'S TWELFTH NIGHT. MacMillan & Co., London.

ELEMENTARY AND HIGHER LESSONS IN ENGLISH (a series of four books in the study of English). Ginn & Co., publishers, Boston.

THE RYERSON MEMORIAL VOLUME, by J. George Hodgins, M. A., LL. D., Toronto.

AMONG OUR EXCHANGES.

In the last number of *Garden and Forest* an account is given of the bequest of Mr. Henry Shaw, of St. Louis, of the whole of his estate, appraised at nearly $3,000,000, and producing a net income of $50,000, for the founding of a botanic garden. It is in the hands of a board of trustees with Prof. William Trelease, the well known botanist, as director. With such an income at his command Prof. Trelease will be able to lay the foundation of an establishment of such scope, that it will soon make St. Louis the botanical centre of the New World.

A writer in the November *Bookman* in a paper on "The Greek Golden Treasury," says, "The more the Greek language is expelled from schools, the greater, apparently, is the general curiosity about Greek literature. Translations multiply, and it seems not beyond hope that everyone who deserves to know Greek will finally learn it for pleasure, while persons to whom it is merely pain and grief will be spared the terrors of *Tupto*, and of irregular verbs."

Forum for December is filled with instructive articles upon subjects which are attracting public attention everywhere.

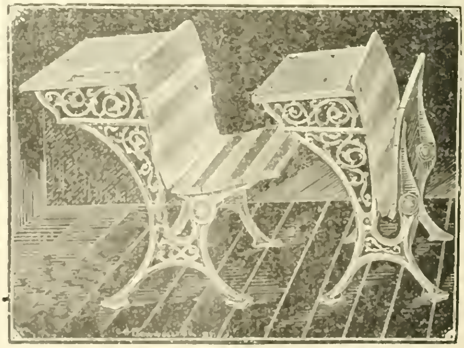
The most striking feature of the December *St Nicholas*, which is also the Christmas number, is the opening article on "The Boyhood of Thackeray," by his daughter, Mrs. Ritchie, illustrated by fac similes of letters and drawings, for the first time given to the public. The frontispiece is a bust taken when he was eleven years old, and at the close of the sketch is a reproduction of the last photograph taken of the author who endeared himself to the public.

In the December *Popular Science Monthly*, Dr. Charles C. Abbott, in a valuable article entitled "The Descendants of Palæolithic Man in America," shows that the Eskimo as well as the Indian had a probable Palæolithic descent. Among other important papers is a very interesting sketch of the founding of the Royal Society of England, by Dr. William C. Cahall, and Jessie O. Waller says some good things in her paper on "Mental and Physical Training of Children."

In the October *Microscope*, which now, by the way, is published at Trenton, New Jersey, Dr. Stokes gives a valuable article on microscopical aquaria for winter use. "Amateur" gives his Article No. 11. on microscope stands, and is very severe on the cheap high power machines called French Triplets.

The American Geologist, published at Minneapolis, U. S. A., at $3.50 per annum, has a good November number. Some of the leading articles are: "Mathematical Theories of the Earth," "Geology in the High School," "The photographic survey of a State," "On a possible chemical origin of the iron ores of the Keewatin in Minnesota," "Review of recent Geological Literature."

The New York *Science* comes filled every week as good as if there had been no previous issue. A splendid weekly review of the condition of contemporary science.



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JOSEPH JEFFERSON

DURING 1890 *The Century* Magazine will publish the long looked-for Autobiography of Joseph Jefferson, whose "Rip van Winkle" has made his name a household word. No more interesting record of a life upon the stage could be laid before the public. His story of the early days of the American stage, when, as a boy, travelling in his father's company, they would settle down for a season in a Western town, playing in their own extemporized theatre,—the particulars of the creation of his famous "Rip van Winkle," how he acted "Ticket-of-Leave Man" before an audience of that class in Australia, etc.,—all this, enriched with illustrations and portraits of contemporary actors and actresses, and with anecdotes, will form one of the most delightful serials *The Century* has ever printed.

Amelia E. Barr, Frank R. Stockton, Mark Twain, H. H. Boyesen, and many other well-known writers will furnish the fiction for the new volume. "The Women of the French Salons" are to be described in a brilliant series of illustrated papers. The important discoveries made with the great Lick Telescope at San Francisco (the largest telescope in the world) and the latest explorations relating to prehistoric America to be chronicled in *The Century.*

Prof. George P. Fisher, of Yale University, is to write a series on "The Nature and Method of Revelation," which will attract every Bible student. Bishop Potter, of New York, will be one of several prominent writers who are to contribute a series of "Present-day Papers" on living topics, and there will be art papers, timely articles, etc., etc., and the choicest pictures that the greatest artists and engravers can produce.

Every bookseller, postmaster, and subscription agent takes subscriptions to *The Century* ($4.00 a year), or remittance may be made directly to the publishers, THE CENTURY CO., of New York. Begin new subscriptions with November (the first issue of the volume) and get Mark Twain's story, "A Connecticut Yankee in King Arthur's Court," in that number.

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SINCE 1873, when, under the editorial management of Mrs. Mary Mapes Dodge, the publication of *St. Nicholas for Young Folks* was begun, it has led all magazines for girls and boys. Nothing like it was known before, and to-day, as the Chicago *Inter-Ocean* recently said, "It is the model and ideal juvenile magazine of the world." Through its pages the greatest writers of our time are speaking to the youth of America and England, and the best artists and engravers are training the eyes of the boys and girls to appreciate the highest in art.

Since the first issue Mrs. Dodge has remained as editor, and its history has been one of growth from the first. Tennyson, Byrant, Longfellow, Whittier, Mrs. Alcott, Mrs. Burnett, Charles Dudley Warner, W. D. Howells, and almost every well-known writer of our time have contributed to its pages. There is only one way in which its conductors can make it better, and that is by making more of it. With the beginning of the seventeenth volume (November, 1889) *St. Nicholas* was enlarged. The use of new and clearer type was also begun with the November number.

During the coming year there are to be four important serial stories by four well-known American authors. Athletics and outdoor sports will be a special feature (contributed by Walter Camp, of Yale, and others), and there will be stories of character and adventures, sketches of information and travel, outdoor papers, articles of special literary interest, suggestive talks on natural history, other scientific subjects, and the march of events. Both the December and January numbers are to be holiday issues.

The price will be the same as heretofore, $3.00 a year, 25 cents a number, and all dealers and the publishers (THE CENTURY CO., New York), take subscriptions. New subscribers should begin with November.

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The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 16th. 1889).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 16th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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ALEX. ANDERSON, LL.D., Editor for P. E. Island.
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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

FOUR EXTRA PAGES have been added to this month's issue of the REVIEW, making twenty-eight pages in all. This extra space is to make room for our correspondents and to make up for the extra space given to advertisers, which has been a little larger this year than last.

THAT excellent work, "Meiklejohn's English Language," has been prescribed by the Board of Education for New Brunswick as an additional text-book in grammar, composition and literature for school license of Class I. It is also the prescribed text-book in English for matriculation into the N. B. University.

WE notice that our veteran educationist, Principal McN. Patterson, has been "going for the local government" at the agricultural centennial for not placing the Bible in the public schools as a text-book. Premier Fielding seemed to think that those trained in and for the various churches might have the confidence of their respective denominations in biblical instruction, but that it would not be popular to compel partially instructed teachers to assume the responsibility of instructing all denominations in a text-book the interpretation of which is the foundation of denominational existence. Better the liberty that now is. But Principal Patterson's practice has been better tested than his theory referred to, for Acacia Villa enjoys the highest reputation for the full rounded education given. The moral, the physical, the practical, the theoretical and the æsthetic being all duly and harmoniously developed. We are glad to notice the flattering comments bestowed upon it in the press.

THE article by Dr. MacGregor in another column will be read with much interest by advanced school teachers.

Dr. J. George Hodgins, Deputy Minister of Education, Ontario, has prepared an exceedingly interesting and valuable work entitled "Ryerson Memorial Volume, 1844–1876." It not only gives a panoramic glimpse of the life, educational times, work, and public appreciation of this most eminent of Canadian educationists, but of the development of the educational system in Ontario from the earliest times. This picturesque compilation is a cluster of pen photographs from nature arranged and framed with most effective skill. No one could be better fitted than Dr. Hodgins to produce such a work. Though of nearly quarto size it contains only some 130 or 140 pages.

WE conclude in this number the article by Dr. Fitch. Our readers will find it a good tonic—to be kept at hand and read now and then to arouse fresh enthusiasm in our English literature.

THE letter of Professor MacGregor, of Dalhousie, urging the Dominion Government to assist in studying the marine currents in our coast waters is being generally copied and endorsed, as we would expect, by the public press of the Atlantic provinces of Canada.

THERE is some editorial matter and correspondence that is unavoidably crowded out of this issue. It will appear next month.

WILL subscribers in writing about a change of address be very careful so give their former as well as present address?

IN the Christmas number of the Trinity College *Review*, of Toronto, there was a series of clever sketches by prominent Canadian writers. Mr. Geo. Stewart, of the Quebec *Chronicle*, contributed an article on a "Half Forgotten Singer." The subject of Dr. Stewart's sketch was Dr F. K. Crosby, a gentleman of fine literary tastes, and who was well known to a comparatively small literary circle in St. John some years ago.

WE acknowledge the *Herzlichen Gluckwunsch*, received from Dr. Hall from Berlin, and reciprocate most heartily. We are glad to notice that the *Weekly Monitor* "has him in" for a series of letters from the German capital. This is like the *Monitor*. It has always been one of the most valuable of our exchanges.

SECTARIAN EDUCATION.

An influential provincial daily quotes the New York *Journal of Commerce* as a reliable exponent of public opinion in the United States when it says: "There can be, as it seems to us, no common ground on which Catholics, Protestants, Hebrews, infidels and the irreligious can stand for the support of a school out of the public treasury." Our reading of the trend of thought is very different. The current in the United States appears to be more fully than ever setting in one great massed volume in favor of State education. "The schools would at once assume a higher character, and the young of all classes be much better educated in all that this word implies, if the State would surrender the task and leave it to the care of those who are so deeply interested in the result," says the *Journal;* thus "putting its foot in it," and revealing the hoof at the same instant. History has a broad ocean of testimony to give on the results and character of sectarian education, and the *Journal's* mop, capacious as it is, can hardly absorb the tide. "Those who are so deeply interested in the *results*:" That is, Catholics in Catholicism, Protestants in Protestantism, Hebrews in Judaism, infidels in idol smashing, and the irreligious in deviltry generally. Give them each full and free scope in delimited camps that the education of *all* classes would be much better "in all that this word implies!"

But who are the most interested in the results of education? There cannot be a shadow of a doubt that it is the State. The State has to protect the peace and liberty and life of the Catholic, the Protestant, the Hebrew and the infidel. They have to work with each other, eat bread with each other, and it is acknowledged they should learn to love each other. To carry out the leading idea of civilization—the central truth of Christianity—the sum of the moral law—they have to learn to love their neighbors as themselves. Instead of separating sects, our bounden duty from every point of view is to draw them nearer. Not to be endeavoring to magnify differences and organizing hostile camps of war; but to be recognizing resemblances, relationship and our universal kinship as the children of the great Father whom to love is to be lovable. But still, owing to our imperfect and different kinds of knowledge, different theories of religion, as well as of morals and of political economy, must necessarily be held. Let the various Church organizations do their own duty in their own spheres here by giving specific religious instruction. They have no right to monopolize what is common to humanity. Monopoly of action can in equity be granted only where there is no encroachment on the like privileges of others. The Chapel, the Synagogue, the Sunday School, the Bible Class, the Prayer Meeting, should each in its own way do its own duty. The instant any one of them comes in to say, our worshippers must not work with you, must not buy from nor sell to you, must not meet with you lest they should become acquainted with your ideas or theories, or learn to think you may be as good as one with a different tonsure,—the instant this is done war is declared against the leading principles of civilization and the sum total of Christianity, even should the sect label itself Christian. The *Journal of Commerce* betrays the hand of a not overwise sectary, who unconsciously but most significantly admits that his *ism* is become too obsolete or effete to hold its own in a free and open competition for the suffrages of an intelligent humanity. The Atlantic provinces of Canada are to be congratulated on the harmonious development of public education within them. The State does its part and all young citizens meet on common grounds, and learn to respect and love each other as equals. The churches engage in a rivalry to produce the best types of the religious character, and public charity is so diffused that whenever such eminence of character is shown it receives the homage and the admiration of all.

A LADY TEACHER ON PRIMARY EDUCATION.

A "lady teacher" writes as follows: I have never been afflicted with the "rage for scribbling," but I cannot resist the impulse to send you a word expressive of my interest in and appreciation of your article on "Primary Education" in the EDUCATIONAL REVIEW for November.

You describe exactly, it seems to me, the lady fitted by nature and education to be the teacher of a primary school.

The points to be emphasized are: first, ladies so fitted are rare; second, they should be secured for this particular branch of the service; third, the emoluments should be such as to encourage them to remain in it.

The question arises: How is this to be accomplished? Is it by appealing to the parents through the public journals? or have the teachers the matter in their own hands? or is the Board of Education the proper quarter in which to represent it?

Would not a consideration of these questions be a step in the right direction?

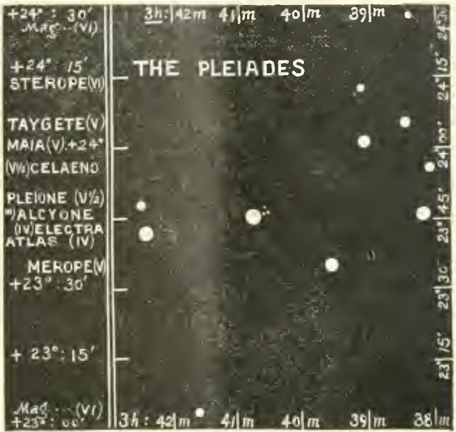
[Yes. Teachers have the matter largely in their own hands. First, by qualifying themselves for their work, entering upon it with enthusiasm and intelligence and making their influence felt in the home. The best way of reaching the parent is through the pupil. Intelligent and systematic effort in moulding the character and mind of the pupil *should* appeal to the parent more strongly than any possible way.—ED.]

Teachers' Institutes.

York County, N. B., Teachers' Institute met at Fredericton on Thursday and Friday, Dec. 19th and 20th. Among the papers read was one by Miss Clark of the Normal School on the "Necessity of Physical Exercises in our Schools" which elicited favorable comment. A pleasant feature of the proceedings was an evening entertainment in the parlors of the W. C. T. U. at which addresses and music was furnished by members of the Institute and others.

The teachers of Victoria and Madawaska met at Grand Falls on Thursday and Friday, Dec. 19th and 20th, and organized a County Institute, with Inspector O'Brien as President. The Chief Superintendent of Education was present and took an active interest in the proceedings. A public educational meeting was held on Thursday evening, at which addresses were delivered by the Chief Superintendent and others. There was an exhibition of manual work from the Superior School, Grand Falls, and from the Grammar School at Andover. Papers were read by D. W. Ross, of the Superior School, Grand Falls; Mr. John Lawson, Miss Lea Dumas and E. M. Brundage. The teachers of the counties of Victoria and Madawaska are to be congratulated on the successful organization of their institute, which adjourned to meet at Edmundston in October next.

The Pleiads.



After the Sun and the Moon and the Big Dipper, no celestial object is better known than the Pleiads. Those who have never seen them have at last heard or read of them; for they have been figuring in song and story from the time that Ulysses steered his raft from Ogygia by them to the time that Amy's cousin watched them from the casement of Locksley Hall. They are mentioned too in our Bible, and perhaps rightly so; at any rate, the notion that the Kimah of Job and Amos is the Pleiads is a notion as old as the Septuagint.

If you don't know them, get some one who does to point them out to you. Or, failing that, go out the first clear evening and find them for yourself. Suppose you do so at nine on January 1st, or at eight on January 16th, or at seven on January 31st, or at any corresponding intervening time on any intervening evening. The hours here given are mean time, your own local time wherever you may happen to live. On the evening and at the hour as above, go out and face south and look up about 70° above the horizon. There! do you see that bunch of stars—half a dozen or so of little fellows huddled close together like a swarm of fireflies, or a brood of chickens, or like anything else that's like them? That's the Pleiads. Take a good look at them so as to be sure of knowing them again when you see them differently placed in the sky.

If you go out again on the same evening, from four to four and a half hours later, you will find them due west and at a more comfortable angle for your neck, just half as high as when on the meridian. Or if you wait until about March 7th you will find them due west at nine o'clock. After this date nine will find them to the north of west and still nearer the horizon. They set about N. W. by W., and this will happen at nine at the end of April. After that you won't see them at this hour until September, when you will find them above the N. E. horizon. Towards the end of October you will have them due east at nine, and at the end of the year nine will again find them on your meridian.

So at nine o'clock you may see the Pleiads somewhere in the sky on any evening from the middle of September to the middle of April. But you need not give them up during all of the other five months. They rise at midnight towards the end of July. If early rising suits you better than late retiring, you may try how soon after May 10th you can see them in the early morning. That's the date when they rise with the sun in our latitude. They set with the sun on May 22nd, and you may also try how close to that date you can still see them in the early evening. The interval between the date of your last sight of them in the early evening and the first in the morning will be the time during which they are visible at no hour. In Hesiod's time, twenty-seven centuries or so ago, and in Boeotia, where he lived, this interval was forty days. Here and now, perhaps you may make it less.

But it is only January as yet, between the middle and end of the month, and we are out doors between seven and eight in the evening. There are the Pleiads on our meridian, due south of our zenith and only 20° from it if we live in the south of Nova Scotia, or 24° in the north of New Brunswick. Before making a closer examination of this particular cluster let us take a look around. A little below and to the left of the Pleiads you see another cluster, V-shaped and with a large red star in it. That's the Hyades, and the red star is Aldebaran, the Bull's Eye. Farther down in the same direction is Orion, the grandest constellation in the heavens, easily recognized by three second magnitude stars in a row and in the middle of a large four-sided figure with first magnitude stars at the upper left and lower right corners. Still farther down and nearly in line with Orion's Belt (the row of three stars) is the Dog-star, the brightest of all the fixed stars. The next brightest above the horizon at this hour and season is Capella, up near the zenith and a little to the east of it. And over in the north-west, close down to the horizon, is Vega, whose acquaintance we made in November. Other first magnitude stars in sight are Procyon, the Little Dog, making a large triangle with the Dog-star and the red first magnitude star in Orion; Pollux, one of the Twins, about half way between Capella and the eastern horizon; and Regulus, in the handle of the Sickle, just above the horizon a little to the north of east. (If you see what seems to be another first magnitude star near Regulus, look in *Astronomical Notes* for December and you will find out what it is). Except Vega, all our objects so far lie on the east side of the meridian, and most of them in the south-east quarter of the sky. In the north-east you see the Dipper standing on the end of its handle. In the north-west, just south of where Vega is setting, the Cross in Cygnus is beginning to set and now stands upright on the horizon. In the west and still well above the horizon is the Square of Pegasus. Between it and the Pleiads are the three stars in the Ram's head. South of these is the Whale where Mira is now invisible to the eye, but may be found with a glass if you located her well during September and October. Right overhead is Perseus, well marked out by the J which his stars form. Just below him, on the west, lies his wife, Andromeda, and to the north-west is the Chair of his mother-in-law, Cassiopeia.

And now if your neck is not too stiff take another look at the Pleiads. How many do you see—five, six, seven or more? With the naked eye I mean just now. Some can see only five, nearly every one can see six, many can see seven or eight. There are eight in the cluster brighter than sixth magnitude, and all these would be seen by an average eye were it not that the faintest two are close to brighter ones and so have the shine taken out of them. But when the seeing is very good, even an average eye can catch all the eight. And eyes of more than average keenness see more. I know persons who say they see ten. Almost every astronomy book will tell you that eleven are often seen, and that that is the number usually seen by not a few persons. Heis says that is the number he sees. Miss Airy, daughter of the late Astronomer Royal, is said to have seen twelve, and to have correctly mapped their positions. Kelper said that Moestlin saw fourteen, and Webb says that Denning and Carrington see the same number. Von Littrow says he has seen sixteen. How many Cagliostro and Baron Munchausen could see I don't know.

How many can be seen with a glass is, of course, quite a different matter. And here it may be as well to observe that while the cluster is perfectly isolated and has well-defined boundaries as seen by the eye, this is not the case as seen through a glass; and the better the glass the less is this the case. How many stars you can see with your glass within what you consider the limits of the cluster is a question which only you can answer. And even you will find it rather difficult to do so. The number you can *see* is one thing, the number you can *count* is another.

Here are some things that may give you some idea as to how many you may expect to see with your glass. In his "Astronomy with an Opera Glass," G. P. Serviss gives a map of the Pleiads containing seventy-five stars and says, "All these may be seen with the most powerful field glass." Young, in his "General Astronomy," gives a map containing eighty, and says, "A mere opera glass shows nearly one hundred." Newcomb, in his "Popular Astronomy," gives a map containing sixty, and says that is how the cluster is seen "through a small telescope." These statements are rather indefinite and apparently not exactly consistent. The following are more definite: Down to magnitude 9.2 Bessel gives fifty-three stars in the cluster, and Dr. Elkin, of Yale, gives sixty-nine. Flammarion gives a map containing 120 down to magnitude 11. Wolff has mapped 499 down to magnitude 14. Dr. Pritchard, of Oxford, says "more than 625 have been seen." The Henry Brothers, of Paris, have photographed many that have never been seen and that may never be seen.

How many you may see depends chiefly on the size of your object glass. To see Elkin's sixty-nine a very good one-inch glass may suffice, but even a 1½ may not. For an eleventh magnitude star nothing less than 2½ inches will do, and some 3½ inch glasses will do no more. To reach the fourteenth magnitude at least ten inches of aperture is needed.

In the map which accompanies this article only the eleven brightest stars of the cluster are shown—the eleven that Heis sees with his naked eye. The map shows them as we see them when they are on the meridian. The positions of the stars relative to each other and relative to the surrounding stars are always the same; but relative to *up* and *down* and *right* and *left* their positions on the map are strictly true only when they are on the meridian.

The one at the top of the map and the one at the bottom have no names so far as I know. The other nine have. Of the two at the left, the lower and brighter one is Atlas, the upper Pleione. Next to the right and the brightest of the lot is Alcyone. To the right and below this is Merope. These two form a quadrilateral with two others above and to the right. The one diagonally opposite Alcyone is Electra, the one opposite Merope is Maia. Above Electra is Celaeno, above that Taygete. The triangle above Maia and Taygete is completed by Asterope or Sterope.

The six generally seen are Alcyone of the third magnitude, Electra and Atlas of the fourth, and Merope, Maia and Taygete of the fifth. If you can see seven the seventh will be either Pleione or Celaeno, both of magnitude 5½. To my eye Pleione is easier than Celaeno. Of the remaining three, Sterope is to me the least easy.

In a small glass the cluster is very beautiful, well worth looking at long and often. One of its prettiest features is the string of small stars running down from Alcyone. It is useful too, containing some good test objects. Sterope is double, and if your glass does not show both stars it is not a very good one. Alcyone has several small companions close on its northwest side. If your glass shows one of these distinctly it is not a bad one; if it shows three it is (if a field or marine glass) a very excellent one.

There are several other things some little notice of which I had hoped to squeeze into this article — the different names given to the cluster and its stars, their meanings, and the probable reasons for their being given; the ancient myths and modern fictions connected with it; the use that was made of it by the ancient farmers and sailors; the evidence it supplies for or against some modern astronomical theories; the drift of its principal stars through space; how the moon behaves towards it, &c.—but the article is already long enough and these matters must stand over.

By the way, if any of you know of any names applied to the cluster or its members other than those used above — and other than the Seven Stars, the Seven Sisters, the Atlantides, Vergiliæ, Kimah (?) La Poussinière, Die Glucke, Ajalkuch (Micmac), Isilimela (Zulu)—I wish you would send them to me along with anything you know as to their meaning and as to where and by whom they are or were used.

C.

Dr. Hall on the German Schools.

Dr. Hall, in writing from Berlin to the *Weekly Monitor*, thus sums up his first impressions of the German Schools:

> Here one may see the principles of Frœbel and Pestallozzi developed on the native soil. I have visited already the kindergarten, germinde school, gymnasium and seminaries. The teacher is a government official, and continues his work until he is rendered unfit either by sickness or old age. He must take a liberal course of study before he enters the profession, and then he ranks with the other learned professions They appear to be satisfied with their work. There is none of that unrest and friction which is too often noticeable amongst our teachers. The work done in the schools is superior. The Germans have a power in their educational work that America—so far as we can judge—does not possess. Possibly at some future time I shall try to define it.
>
> Some of the points that have impressed me are the following:
>
> 1. The general good health of the teacher and pupils.
> 2 The especial care that is paid to the correct use of language in all school exercises
> 3. The cultivation of politeness and good manners is an important feature in school work.
> 4. Music, drawing, and proper physical exercises has each a new meaning and value.
> 5. The pupil is developed fully. There is no partial or one-sidedness in education.

FERNDALE NOTES.

Ox Bot-Fly (or Gad Fly), Magnified.

In our January number of 1888, in *Ferndale School No. VIII.*, is a lesson on the Bot-fly, Gad-fly or "Warbles" of the Ox. From the November number of *Insect Life,* published by the United States Department of Agriculture, we note the following estimates of damage done by the fly. Referring to the investigations recently undertaken by the *Farmer's Review* of Chicago, *Insect Life* says:

> A host of letters from farmers and stockmen were published, which, as far as they related to the habits and natural history of the fly, were, as a rule, pretty badly mixed, and added little if anything to that already known. Reports were also received from professors of agriculture, entomologists, and veterinarians, which give, as did also those of farmers and stock raisers, valuable data concerning its abundance in various States, the loss in value to hides, effect on quantity and quality of beef and milk, and also the effect of the attacks on the animals themselves
>
> From the reports received the approximate percentage of grubby cattle and the average loss on grubby hides for the principal stock-raising States of the Mississippi Valley have been estimated as follows (August 7, 1889):
>
> *Illinois.*—Seventy-three per cent of the cattle marketed in the grubby season are infected with grubs. The average loss on a grubby hide is one-third.
>
> *Iowa* - Seventy-one per cent of the cattle in the majority of counties are grubby in the season specified. Loss on grubby hides one-third.
>
> *Indiana.* Forty-eight per cent of the cattle grubby. Loss on hides one-third
>
> *Wisconsin.*—Thirty-three per cent of cattle grubby. Loss on hides one-third.
>
> *Ohio.*—Fifty six per cent of cattle grubby. Loss on hides one-third.
>
> *Missouri.* Fifty seven per cent of cattle grubby. Loss on hides one-third.
>
> *Kansas.* Sixty per cent of cattle grubby. Loss on hides one-third.
>
> *Kentucky.*—Fifty-seven per cent of cattle grubby. Loss on hides one-third.
>
> In *Minnesota* and *Dakota* grubs are practically unknown among cattle.
>
> In *Nebraska* they are not very bad where found; twelve counties report an average of forty per cent. The rest heard from are free of the pest. Grubby hides are "docked" one-third of their value.
>
> In *Michigan* sixty-one per cent of the cattle are infested with grubs in the southern and middle counties. In the northern counties they are unknown or very scarce. Grubby hides sell for one-third less than sound ones
>
> The amount of this loss can be better appreciated perhaps by re-producing in condensed form the approximate estimate of the loss on the hides of cattle received at the Union Stock-yards of Chicago during the grubby season, which includes the months from January to June Using the reports by States above given as a basis it is estimated that fifty per cent of the cattle received are grubby. The average value of a hide is put at $3 90; and while from the report referred to one-third value is the usual deduction for grubby hides in this estimate, but $1 is deducted, or less than one-third.
>
> The number of cattle received in 1889 for the six months indicated was 1,335,026, giving a loss on the fifty per cent of grubby animals of $667 573. When to this is added the loss from depreciated value and lessened quantity of the beef, the amount for each infested animal is put at $5, indicating a total loss on these animals from the attack of the fly of $3,337,565.

(For the life-history, and description of form, habits and work of this insect see Educational Review, Vol. I., No. 8, January, 1888.)

For the Review.]

Educational and Industrial Drawing.

A primary free-hand manual, with four drawing-books to go with it, by Langdon S. Thompson, A. M., has been recently published by D. C. Heath & Co., Boston. The manual is wonderfully clever and original and is divided into two parts, viz.: the introduction and the analysis of the four free-hand books which accompany it. Chapter I. deals ably with *The Study of Form; Acquiring Ideas of Form; Expressing Ideas of Form; Summary;* and ends with the pertinent question: *Is drawing for all?* We give the answer: "Since all must live in space and deal with it constantly, and since through the eye, the hand and the mind, all are put in communication with space, *Drawing,* the universal representative of the space-arts, is adapted to the wants and necessities of all; and the ability to learn to draw will be found to be as general as the faculty for learning any other art or subject." "Can everyone become a great artist? No! Likewise, if it is asked, can everyone become a great orator, a poet, or an author, the answer is still, No! But every ordinary person "can learn to talk, to read and to write; and these are the means by which the orator, the poet and the author express themselves. So, also, is drawing a language used to express thought; but he who has no artistic thought or emotion to express cannot use his language for that purpose, although acquainted with it. When all are taught to read and to write, it is only expected that one in ten thousand, or more, will be a poet or an orator. Why ask for a greater proportion of artists when all are taught modelling or drawing?"

Chapter II. deals with *The Means, or the Materials and Implements.* These observations are so careful and complete that they will be of special value to the young teacher who wishes to do good work in drawing but does not know how to set about it.

Chapter III., "*The thing to be done*": 1, "To instruct and develop the mind and the taste"; 2, "To present motives for action; that is, conform the instruction to the nature of the mind, or, in other words, to make it interesting." In order to develop and instruct we must first "make a wise selection of subjects," and secondly, "use the best methods of teaching." In short, the aim should be in a general course of drawing in the common schools to lead the pupil to receive and appropriate as his own "the greatest possible number of distinct ideas with the east amount of merely manual labor; remembering also that the trinity in practical art is the mind, the eye and the hand,—the eye to perceive, the mind to conceive, and the hand to execute or express." Whilst this Manual and accompanying books may be taken up advantageously whether or no the pupil has done anything in clay-modelling, Mr. Thompson pleads warmly, and, we think, unanswerably, that children first have an opportunity to express their ideas of form in solid matter, such as clay, paraffine, etc., to be followed by cutting out and folding of stiff cardboard so as to form different geometrical solids capable of this method of treatment. The actual contact of the hand with plastic material, which ensures the fullest exercise of the muscular sense, lies at the foundation of all industrial and fine arts and cannot be neglected without serious loss. Clay-modelling lends itself to feeble and unskilled hands, and while it was, probably, the first medium through which man made his earliest essays in art, a Michael Angelo or Thorwalsden gratefully accept it as an aid in giving form and shape to their noblest conceptions. Any teacher who will study the "Manual Training," Manuals Nos. 1 and 2, and this Primary Freehand Manual, will gain a very clear and distinct idea of the place which drawing should occupy in our common school course; what we may reasonably expect to accomplish by it, when instead of teaching it by mere imitation we make it the vital expression of the thoughts and feelings of the child. *The ready expression of thought by a few simple lines* is the point aimed at by your author, and his use of kindergarten sticks, to illustrate the attitudes and movements of the human figure, is as amusing as it is effective. He gives Hogarth's famous diagram representing a soldier, with his bayoneted gun on his shoulder, going into an alehouse, followed closely by his dog, the whole represented by three lines. We will take at random a few things to be done and some questions to be answered. "Draw a man walking fast. Draw another man walking still faster. Draw them walking towards the right and again walking towards the left. Less than twelve lines with a small circle for the head does this. Draw a right angle in eight different positions. Draw an isosceles triangle with one right angle. In Lesson XLIV. point out and count the wave-lines and the different kinds of angles. Compare two specified lessons as to beauty." A careful examination of this Manual proves that a pupil of ordinary intelligence, who had gone through the course here laid down, might reasonably be expected to answer the questions and do the work required fairly well. Such a pupil would then be well prepared for more specialized work, and in any case would be vastly better prepared for practical every-day work than he would have been without it. Some English authorities to whom the book has been shewn give it unqualified praise, which is valuable coming from those who fully recognize the value of drawing, not only as the *a, b, c* of Manual Training, but as a power in quickening and developing the intellectual and æsthetic faculties. When our teachers reach this point of appreciation and prepare themselves by study of improved methods and of the philosophical principles that underlie those methods, the whole position will be carried so far as our common schools are concerned. If drawing and allied subjects are soundly taught there for a decade or two, fine art and the useful arts will have a fair chance, for they will rest on a solid foundation. Meanwhile we recommend the study of this course by a successful teacher, who is at once original and practical, to all those who should take an intelligent interest in the subject.

C.

THE vexed question of French schools in Ontario appears to be on the way to an intelligent solution. A Teachers' Institute has been established for the counties of Prescott and Russell, at the first meeting of which, last week, nearly all the teachers, French and English, were present, and a system of bi-lingual instruction for the schools exemplified and adopted. There is no lack of harmony among the people themselves as to the desirability of the children being educated in both languages.—*L'Evangeline.*

For the Review.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

THIRD PAPER.

The following is the substance of a paper by Dr. A. E. Winship on "Music in Schools":

We teach singing for character, for enjoyment, for the home.

That which singing may accomplish for man is every way as important to the man and to the world as that which is accomplished by arithmetic, geography, language or drawing. It is not as important as reading, which really counts for as much as all the other branches.

Singing is closely related to health, to choices, to intellectual activity,—consequently it is vital to the character. A man's success in life depends largely upon his courage, peace of mind, freshness, hopefulness, and elasticity. Singing is helpful in all these directions.

We must get more out of singing than a knowledge of the scale or ability to sing a song. Music teaching in schools must do for the child in thought, sympathy and choice all that it is capable of accomplishing. Thinking and singing ought to be companions.

The enthusiasm for intellectual activity in the school room dates from the time that singing in the public schools was so enthusiastically introduced.

Singing should be taught almost wholly for its effects aside from ability to sing. Singing cannot be well taught that does not, while making intelligent singers, benefit the whole physical being through attitude, breathing, and vocal elasticity: that does not make thought more keen, that does not give greater power of abstract conception; that does not make choices more correct, the moral perceptions more accurate, the disposition more uniform.

Singing is to be taught the whole child. His entire being, mentally, physically, industrially, morally, is to be vibrant with health, elasticity, energy and cheerfulness. Like most branches it needs to be taught from the lowest grade to the highest. It is needed for patriotism, morality, health, for lightening discipline, making school attendance more regular, school management easier, study more interesting, recitation more spirited.

What the wings are to the bird, the blossom to the plant, the juice to the fruit, the eye to the face, fervency to the voice, singing is to the school.

Continue the breathing exercises followed by singing a long sustained tone about F or G to the vocal sound ai after taking in a full breath. Be careful that all keep the teeth well opened, also that the vocalized stream of air strikes the palate near the root of the upper teeth. Let the teacher pass along the lines and listen to each pupil to ascertain that he is singing in tune. If not help the pupil to raise or lower his voice to the right pitch. Where the pupil still fails, ask him to listen whilst the others sing. Sing again to ai, but in the same breath change to ah, and be careful that the sound keeps forward and does not go back as it is apt to do. These exercises are to secure pure and good tone.

Still drill the class well on the notes of the Doh chord. If the class have difficulty in taking m in ascending from d then remind them of the calm, peaceful character of that note, and sing d s m d, dwelling on the m, and then again try d m s m d. The class may also fail to sing m coming from upper d, which we call onedoh, and write thus d', then come away from modulator, impress on the minds of the class the character of m, and go back and point d'm, and the class will most probably sing the note correctly.

Accent and Time.—In last lesson we spoke of 2-pulse measure, where each second beat has the strong accent, and the other pulse has the weak accent. Sometimes the strong accent is on every third beat. Let the teacher sing to one tone | La la la | La la la | La la la | and ask the pupils to tell where the strong accent falls; then sing the syllables in the same way. Then sing a succession of ds in the same way. Ask the pupils to write the notes to show the accent:

| d:d:d | d:d:d | d:d:d |

Then get the pupils to sing each note of the chord the same way. Then d to first measure, m to second, s to third, and d' to a fourth.

In the same way treat an exercise beginning with the third beat of the measure:

:d | d:d:d | d:d:d | d:d‖

Tell the class that if we have one pulse of a measure at the beginning of the exercise we require what is necessary to complete the measure at the end of the exercise.

The time name for a note, one pulse or beat is taa, and if the note is continued a second beat aa, thus:

| d :d | d :— |
taa taa taa-aa.

The exercises on time and tune will be made more interesting if one section sing the one note d, giving the accent distinctly, while the other sings the exercise, then changing parts:

| d:d | s:s | m:— | s:s | d:m | s:— | s:m | s:s | d:—‖
| d:d | d:d | d:— | d:d | d:d | d:— | d:d | d:d | d:—‖

In each lesson remember to give ear exercises.

A.

On Calculus Dodging and other Educational Sins.*

By Prof. J G MacGregor, D. Sc.

Ladies and Gentlemen:—You are aware that we have recently been reorganising the classes in the department of Physics in this college, and that we now offer students courses of instruction in three stages of advancement. We have first an elementary class in Physics generally, in which we take a rapid survey of the whole subject, treating Dynamics only to the extent to which it is necessary as a foundation for the other sections of the subject. The members of this class are assumed to be familiar with the elements of Geometry (six books of Euclid) and of Algebra, but to have no knowledge of Trigonometry. We have next intermediate classes in Dynamics and in General Physics, the course of study extending in the case of the latter over two years. In these classes a knowledge of Trigonometry is assumed, but not of Analytical Geometry or of the Differential and Integral Calculus. Nevertheless in the endeavour to give as extended a knowledge of the subject as possible, the methods of the Calculus are frequently employed, though its symbolism is not introduced. We have finally the advanced classes in Mathematical and in Experimental Physics, the work of the former involving a knowledge of Analytical Geometry and of the Calculus, that of the latter consisting in the study of original memoirs and standard treatises, and in practical laboratory work. It is this organisation of classes which I wish to discuss with you to-day before entering upon the work of the session.

And first let me say that of course I admit that in a fully developed educational system the elementary class certainly should not find a place in the university. It is provided in our college only because our schools are not yet sufficiently far advanced to take it off our hands. And I wish to vindicate for it a position, not in the college course, but in our educational system somewhere. At present, if anywhere, it must be in the college. Ultimately, and let us hope soon, it may be transferred to the high school. Let me say also that just as certainly the advanced classes ought to find a place among university courses of instruction. There will be no difference of opinion on that point. But there is difference of opinion as to whether, either in school or in college, there ought to be classes such as those I have referred to as elementary and intermediate.

In organising our classes in the manner described, I have been influenced very greatly by strong faith in the educational as well as the practical value of a study of Physics. It may be, perhaps, that as a teacher of Physics I am inclined unduly to magnify my office. But certainly, while I admit other subjects to be more efficient as means of training special faculties, I hold Physics to be, next to Literature, the best of all subjects of study as a means of general education. You are aware that it is the most highly developed of the physical sciences, that it is the best example we have of the combination of the inductive and deductive methods of reasoning, and that it embraces generalisations of all orders of generality and hypotheses of all degrees of probability. It therefore seems to me to provide, in the modes of reasoning which it calls into play, the closest analogue to the reasonings which we require to apply to our every day life. That being so, it would appear to be desirable that not only all our university students, but also all our youth, should as far as possible enjoy the advantage of a study of this subject before entering upon their life-work.

There is one difficulty in the way of the realisation of this ideal, however, and that is, that the peculiar benefit of the study of Physics is not derived unless the student already possesses a certain amount of mathematical knowledge. And hence the question arises as to the stages of mathematical advancement at which the subject of Physics may, with educational advantage, be taken up. On the one hand we have the fact that the more mathematical power the student possesses the greater will be the fruitfulness of his study of this subject, and on the other the fact that most persons enter upon their life-work with a comparatively small amount of mathematical knowledge, and that only the privileged few attain to any extensive mathematical power.

In settling this question I have naturally been guided by the circumstances in which we find ourselves. The arrangements of our school and college curricula make it comparatively easy for any one to obtain a knowledge of the six books of Euclid and of the elements of Algebra. I have therefore thought it desirable that an elementary class should be provided taking this amount of mathematical knowledge as the basis of its work. The great majority of those who go farther in mathematical study get at least a working knowledge of Trigonometry and of Geometrical Conics, but stop short of Analytical Geometry and of the Calculus. This class includes many men who, without any greater mathematical equipment, will enter the various engineering professions, and who, therefore, from a practical point of view, ought to be able to obtain as extensive a knowledge as possible, especially of Dynamics, but also of the other branches of Physics. I have therefore made

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Geometry, Algebra and Trigonometry the basis of the work of our intermediate classes.

This arrangement of classes, however, is not justified by the mere fact of its being desirable that men in both the above stages of mathematical study should have the advantage of a study of Physics. It must further be shewn that with the mathematical equipment assumed the work of our classes can be adequately accomplished. That it can, seems to be the opinion of a large body of teachers. For there are many text-books available for both classes, which are quite suitable in scope and in the amount of Mathematics assumed. And these books have not only been written by men who presumably believed in them, but shew by their extensive sale that they meet a felt want. This opinion, however, is not universally held; and the immediate occasion of this address is the publication (in *Nature*, vol. XL., p. 126) of a paper on "The vices of our scientific education," in which the opposite opinion is maintained. Its author, Prof. G. M. Minchin, is so deservedly eminent as a teacher in the department of Mathematical Physics, that the severe strictures which he makes on some portions of the work which I have sketched out for our classes here, have led me to reconsider the whole matter, and lead me now to bring before you the reasons why, notwithstanding his criticism, the maintenance of the present organisation of our classes seems to me to be justified.

Prof. Minchin's criticism of the work which we propose to do in our intermediate classes has reference to that part, in which we employ the methods of the Calculus without using its symbols and without requiring students to have previously obtained a knowledge of that branch of mathematics. "It may perhaps be best described," he says, "as Calculus dodging. For some curious reason, which I have never discovered, it has been generally assumed that a student can possess a very extensive knowledge of the results and principles of Dynamics,—of the composition and resolution of forces and couples in three dimensions, of the principle of work and energy, of the nature and properties of tubes of force, potential, etc.,—without any knowledge of the Differential or Integral Calculus. This is surely a piece of self-deception." If so, there can be no justification for a considerable portion of the work of our intermediate classes; and it is necessary therefore to enquire into the validity of this criticism.

But let me note first that the Calculus dodgers are a most respectable body of men. The most artful dodger of them all is Clerk Maxwell, whose book on the Theory of Heat, just because he obtains in it important thermodynam results, usually established by the aid of the Calculus, in such a way that readers who have no knowledge of the Calculus can follow him, has obtained a wide popularity and is very extensively used. In Electricity, Cumming dodges, more laboriously it is true, but still to good purpose. In Optics Glazebrook takes the same course, and to men of small mathematical equipment throws a flood of light on a region that was cloudy and dark before. In Dynamics, Clifford was a dodger of great power; and even Thomson and Tait do not disdain to employ the process when they can do so with elegance and grace, though they despise the laborious dodging which involves the use of unwieldy formulæ. May we not rank even Newton himself as a dodger though he had no Calculus to dodge? At any rate all those teachers who in these latter days encourage their pupils to study Newton, must be held to be guilty of aiding and abetting in the practice of this educational sin. And, indeed, we may increase the number of our allies to an almost unlimited extent by noting that whosoever establishes, without formal integration, the familiar laws of the motion of uniformly accelerated bodies, must be considered to be one of the noble army of dodgers.

We cannot settle a question of this kind, however, by authority. Prof. Minchin's hand may be against every man, but it may, nevertheless, have grasped the truth. Hence we must look into this charge of self-deception. Prof. Minchin merely makes the charge. He does not shew where the deception of self comes in. But I think one or two considerations will shew it to be unfounded. For what after all is it that the dodger does? He finds himself under the necessity of treating certain special variable quantities, without being able to make use of the knowledge which mathematicians have acquired of variable quantities generally, because his pupils do not possess it. Hence he treats the special quantity, if he can hit upon no better plan, and if the process is not altogether too cumbrous, in the same way as the mathematician has treated the general variable, and thus attains the same result as if he had applied to the special case the general results of the Calculus. There can thus be no more self-deception in dodging the Calculus than in obtaining the same result by applying it, provided always the dodging is properly done. It may, of course, be bungled; and I think it must be admitted that the dodging is more liable to be bungled than the applying, as it is a much more difficult process. But this should lead us rather to look carefully into each particular instance of the method than to indulge in general condemnation.

The next point in Prof. Minchin's indictment against Calculus dodging must to a large extent be admitted. "Special devices," he says, "exhibited 'for this occasion only,' confer no independent power on the student." Doubtless the dodger cannot in general expect to make his pupils dodgers also. For he is able to dodge chiefly by virtue of his knowledge of the Calculus, ignorance of which on the part of the pupil makes the dodging necessary. And thus little independent power is evoked in the pupil by the study of this portion of the teacher's work. The result of the teaching is that the pupil is satisfied of the accuracy of a result which in the opinion of the teacher is worth the trouble of the dodging process. Thus it is by many regarded as worth this trouble to establish "the nature and properties of tubes of force, potential, etc.," not in the hope that the student may be able to establish independently any co-ordinate theorems, but because the properties referred to if once established may be very widely applied. For a different reason it is worth this trouble to determine the attraction of a uniform material spherical shell on an external particle. The student will find the law of its attraction assumed in elementary books on Electricity and Astronomy, and it is a great satisfaction to him to have been convinced of its accuracy, even though the method by which it was proved to him may not have been one which he could apply to other similar problems. While therefore we must admit that in general dodging does not tend to foster independent power, we claim for it other advantages which seem to justify its use.

When, however, Prof. Minchin says that "the processes of differentiation and of elementary integration are not difficult of acquirement, and it seems to me they ought to be studied before such an extensive inroad is attempted into Dynamics," and that "if more time were spent in teaching the mathematical principles on which quantitative Physics depends, there would be less need for such methods, and in the long run the student of Physics would be a gainer," I find myself able to agree with him. Calculus dodging seems to me to be in many cases justifiable; but its application would be in all such cases preferable. We would draw different conclusions, however, from this common opinion. He would postpone the serious study of Physics not only until Geometry, Algebra and Trigonometry have been studied in as great detail as at present, but also until the elements of the Differential and Integral Calculus have been studied. I would, on the other hand, venture to suggest to mathematical teachers, that they should take into consideration the introduction of the elements of the Calculus at an earlier stage of our mathematical courses. The former change would have the unfortunate effect of restricting the study of Physics to the few whose mathematical tastes lead them to devote a great deal of time to that subject. The latter would have the advantage of enabling the many, who undergo a shorter course of mathematical training, to acquire facility in the use of an instrument, which would render it possible for them to enter with advantage upon departments of Physics, to which the only entrance at present is through the dodger's gate.

In selecting branches of Mathematics as subjects of instruction in school and college classes, it should be borne in mind that this subject is studied, not only as an admirable species of mental gymnastic, but also as an indispensable instrument for pursuing study in other branches. And neither of these objects should determine what the course of instruction is to be to the exclusion of the other. Considering what important fields are opened up to the student by even a slight knowledge of the Calculus, it may rightly be introduced into elementary mathematical courses, even if its introduction should somewhat impair their gymnastic efficiency. I am not by any means sure that the details of Algebra, Geometry and Trigonometry, which might thereby be crowded out, would be more valuable educationally than the new matter which would be introduced. But there can be no doubt that the change would result in an enormous increase in the practical value of the elementary mathematical course. And the reconstruction of these courses on the most practical lines consistent with sufficient educational benefit, demands, I venture to think, more consideration from mathematical teachers than it has hitherto received.

Meantime, since there is a large body of men who must study Physics and who know nothing of the Calculus, the only course open to teachers is to dodge the Calculus to the best of their ability.

On the work prescribed for our elementary class, the study of Dynamics and of other departments of Physics, without the aid of Trigonometry, Prof. Minchin makes some very severe strictures. The immediate object of his criticism is the matriculation examination of the University of London, which requires of candidates a considerable knowledge of Dynamics, while at the same time requiring in Mathematics only four books of Euclid and no Trigonometry. In our elementary class we assume familiarity with six books of Euclid; and therefore some of Prof. Minchin's strictures do not apply to us. All those based on the lack of knowledge of Trigonometry, however, apply directly and hence I quote them. In assisting a young relative to prepare for the London examination, he "found it," he says, "quite impossible to impart anything that could with propriety be called a knowledge of Mechanics without the aid of Trigonometry. In the Composition and Resolution of Forces a few questions made specially to order, which usually depended on the facts that the sine and cosine of 45° are equal, and that the sine of 30° is $\frac{1}{2}$ — although, of course, the mention of a sine or cosine was inadmissible — exhausted the field; and the same restrictions were imposed on the treatment of Moments, so that I was obliged to abandon the task and to insist on a small knowledge of Trigonometry and the Sixth Book. In such a cramped and stunted knowledge there is nothing of spontaneity, nothing of power, but much of danger." It will be noticed that this criticism applies only to Dynamics. But as the study of other departments of Physics is based on that of Dynamics, the whole work of our class is shewn to be faulty, if this criticism is valid. Let us see then what it is worth. The only definite statement made is that in the discussion of the composition and resolution of forces, and in the treatment of moments, the range of illustrative exercises is so narrowed by the lack of Trigonometry that no spontaneity and no power can be developed in the student. Now (1) the great stress which Prof. Minchin lays on the sections of Dynamics to which he refers, seems to me to be an instance of the scrappiness of treatment, of which he justly complains as characterising most elementary dynamical text-books. For there are other sections of the subject admirably adapted to develop spontaneity and power, which do not involve either the composition and resolution of forces or the treatment of moments. It is true that in the older scrappy books these sections are very inadequately treated, but in more recent and more systematic books their treatment is as thorough as their importance demands. And for the sake of these portions alone Dynamics would seem to me to be quite worthy of study from an educational point of view. Even therefore if the above criticism were valid, and problems involving composition and resolution of forces incapable of adequate treatment without Trigonometry, the study of Dynamics without the aid of Trigonometry might still be vindicated, though certainly not according to the syllabus of the London University matriculation examination.

But (2) the number of available problems illustrative of the composition and resolution of forces and of the treatment of moments, though certainly narrowed by the lack of Trigonometry, is, I think, not narrowed to nearly so great an extent as Prof. Minchin imagines. The teacher is certainly not restricted for illustrations to cases in which the forces are inclined at angles whose trigonometrical ratios have simple values. For example, problems on the action of forces on bodies supported on inclined planes are available, provided the plane in each case is specified, as is frequently done in Engineering, by giving two of the three sides of the right-angled triangle by which it is conventionally represented. Such problems as the determination of the tensions in two strings, by which a heavy body is suspended from given points, are also available. And so also (to take a case involving moments) are such problems as the determination of the position of equilibrium of a beam resting on a horizontal rail with one end pressing against a vertical wall. Scores of such problems might be quoted, no more "specially made to order" than if they were couched in trigonometrical terms, and quite independent of the simplicity of the trigonometrical ratios for particular angles. The only problems which, so far as I can see, would not be available, are complex ones, the geometrical treatment of which would be practically too cumbrous.

Let it be noted also that the dynamical difficulties which are involved in the solution of problems are the same whether Trigonometry be employed in their solution or not. Hence the same spontaneity in grappling with dynamical difficulties, and the same power of overcoming them, are evoked in the student who solves them by geometrical methods as in him who is able to apply Trigonometry. Unless, therefore, Prof. Minchin is ready to maintain that spontaneity and power are the result of solving problems of the very complex kind only, his criticism falls to the ground. Such a position, however, would be quite untenable; for the simpler problems may certainly be made to present a sufficient array of difficulties to render skill and resource necessary for their solution. And, moreover, in at least a great many of the problems from which a student ignorant of Trigonometry is excluded, the main difficulty to be overcome is a mathematical one, and the chief power evoked by their solution is facility in dealing with trigonometrical formulæ. But Prof. Minchin himself, in the paper under consideration, protests, with as much force as justice, against making Physics a kind of disguised Mathematics. He cannot, therefore, regard it as an objection to any proposed mode of treating this subject, that it is inferior to another mode in the development of trigonometrical power.

So far as my experience goes, thoroughly accurate dynamical notions may be conveyed to students who know no Trigonometry, and quite sufficient power of dealing with the effects of the exertion of forces on bodies may be acquired by them, to serve as the basis for a valuable course of study in general Physics. They will, of course, find that in the application of their knowledge in special cases, they are continually hampered for lack of mathematical knowledge. But this experience will serve as a stimulus to them in their mathematical studies, giving the interest of practical value to what might otherwise appear to be a mere species of mental gymnastic.

I have now shewn you, at somewhat wearisome length, why it is that Prof. Minchin's criticisms on the kind of work which we propose to do in our more elementary classes, seem to me to be without foundation, and why, therefore, notwithstanding his criticisms, I intend to maintain the present organisation of classes in our Physical Department. To you I must trust to give the system a thorough trial. And I think I can promise you, that if you devote to the subject a fair share of your time and energy, you will not find yourselves at the end of your course, so lacking either in spontaneity or in power as Prof. Minchin would have us believe, although you may have indulged somewhat freely in Calculus dodging and other educational sins.

IN its issue for December 28th, the *Scientific American* says of the influenza now epidemic in Europe: The disease is not dangerous, except sometimes to children or the aged, while the former often show a decided exemption. * * The disease is undoubtedly due to some micro-organism which floats in the air, and which infects the human system, but is generally killed in so doing. For influenza is but slightly if at all contagious."

DIE STEEL should contain from eight to one per cent of carbon and no manganese, water tempered to a straw color. Professor Robertson-Austen says such a die will strike 40,000 coins without fracture or deformation. If it contained one per cent more it would not strike 100 without cracking. If it contained two per cent less it would be hopelessly distorted and its engraved surface destroyed.

AN ARAB SAYING.

Remember, three things come not back:
The arrow sent upon its track—
It will not swerve, it will not stay
Its speed; it flies to wound or slay.

The spoken word, so soon forgot
By thee; but it has perished not:
In other hearts 'tis living still,
And doing work for good or ill.

And the lost opportunity,
That cometh back no more to thee,
In vain thou weepest, in vain dost yearn,
Those three will nevermore return.

Constantina E. Brooks, in the Century.

Literature, the Sunshine of a Busy Life.

(Concluded).

But, as you know, when a nation comes to reckon up the great names in its literature, it is not the historian or the philosopher who is put in the foremost place, but the poet. And the reason of this is plain. You want higher and rarer gifts to make a poet than to make a respectable writer in any other department of literature. Poetry has been defined as the breath and finer essence of all knowledge, and George Eliot, I think it is in Middlemarch, speaks of the poetic gift as showing itself "when knowledge passes into feeling, and feeling again is given back as a new instrument of knowledge. A man may train himself by diligent cultivation of very ordinary qualities to be a meritorious novelist, or historian, or write a grammar or a physics; but he cannot train himself to be a poet. That name is reserved by universal consent for the man who, in addition to whatever acquired knowledge he has, possesses also "The vision and the faculty divine;" that gift of imagination, that innate perception of the reality which lies beneath the surface of things, which we call genius. The very word "poet" implies creative power, and this is far beyond the power to remember, to reflect, and to know, for all these are powers which might be communicated by education or acquired by continuous effort And hence in all ages the greatest and most original minds have expressed themselves in poetry, and the men of whom their countrymen have been proudest have been the poets.

Consider for a moment how many and varied have been the forms in which the poetic instinct has at times manifested itself. You could not say beforehand what subjects were or were not susceptible of poetic treatment; because all subjects—even those which at first sight appear to us most prosaic, admit of being touched with emotion and illuminated with the hues which a glowing imagination and a deep spiritual insight and sympathy can cast upon them. And when this finer touch and sympathy and insight are present, you have poetry. When they are absent you may have plenty of excellent verse and faultless rhyme; but you have no poetry. The subject matters little. The treatment of it matters much. For example, if we are to define lyric poetry, we should say that its fitting topics were love, war, the beauty and the glory of the visible world, or any subject which arouses strong emotion. And we might illustrate this by the rolling verse of Milton, as he exults in the thought of approaching Christmas:

Ring out, ye crystal spheres,
Once bless our human ears,
If ye have power to touch our senses so.
And let your silver chime
Move in melodious time,
And let the bass of heaven's deep organ blow.
And with your nine fold harmony
Make up full concert to the angelic symphony.

Or take the expression of rapt enthusiasm and delight with which Shelley watched the sky-lark, as he sang:

Teach us, sprite or bird,
  What sweet thoughts are thine
I have never heard.
  Praise of love or wine
That panted forth a flood of rapture so divine,
  Better than all measures
Of delightful sound,
  Better than all treasures
That in books are found.
  Thy skill to poet were thou scorner of the ground,
Teach me half the gladness
  That thy brain must know
  Such harmonious madness,
From thy lips would flow,
  The world should listen then, as I am listening now.

There is a kind of inspiration to be caught from the sound of such music, which may well account for the charm which the odes and songs of Milton, of Dryden, of Burns and Shelley have for all readers. And we might be disposed to think that lyric poetry ought to confine itself to such subjects, were it not that Wordsworth and Coleridge and Gray have shown us how possible it is that very different subjects may become proper material for lyric poetry, in the hands of a master.

We should have thought that the old Platonic doctrine of a pre-existent life and of the relation of knowledge to reminiscence was better fitted for a philosophic treatise than for a lyric poem, yet in Wordsworth's noble ode on Intimations of Immortality, a poem in which it has been said with some truth that the poetic power of this century reached its high water mark, you may see this subject so suffused with beauty and with strong emotion that you feel yourself transported above the region of speculative philosophy into the serener atmosphere inhabited only by the seer, the prophet, the inspired poet. So it would by most critics seem almost an axiom that ethics, the whole theory of human duty and obligation and obedience to law, are fitting topics for treatises on morals and not for odes and poems. Yet hear a stanza from Wordsworth's Ode to Duty:

"Stern law-giver, yet thou dost wear
  The God-head's most benignant grace,
Nor know we anything so fair
  As is the smile upon thy face;
Flowers laugh before thee in their beds,
  And fragrances thy footing treads;
Thou dost preserve the stars from wrong,
  And the most ancient Heavens, through thee are fresh and
    strong."

Who does not recognize here the power there is in poetic genius to irradiate the province of the moralist and the preacher, and to give a new charm to the truths they have to teach?

In like manner we should none of us at first sight suppose that polemical controversy or natural theology was a fitting subject for poetic treatment, yet Dryden, as you know, put the whole of the argument for and against the Church of Rome and the Reformation into verse, which at the time when it was published attracted more attention than any other form of argument would have drawn to it, and which for ingenuity and strength and command of language is still read and admired. There is a place in literature for didactic poetry, for although the enforcement of truth is not the poet's first business yet it is quite within his province so to touch his subject with tender feeling, with graceful fancies, as to present truth in a new light. Pope, as you know, undertook to expound in the Essay on Man that purely natural theology which Bolingbroke and the deistic philosophers of that day had made famous.

It cannot be said that Pope added much strength to the philosophic argument, but his poem is read though. Bolingbroke and Shaftesbury and Warburton are well nigh neglected, and the reason will be plain to you when I read even four lines of that famous composition:

"All nature is but art unknown to thee,
All chance, direction which thou canst not see,
All discord, harmony not understood,
All partial evil, universal good."

From the point of view of philosophy these may be mere platitudes, but the felicitous choice and collection of words and the musical rhythm give an additional charm to whatever of truth there is in the philosophy of Bolingbroke, and a place for that philosophy in the history of literature, such as mere speculative discussion would never have secured for it.

But one of the highest forms which poetic inspiration has assumed has been the production of *epic* poems. Addison following generally in the lines once traced by Aristotle has laid down the conditions that ought to be fulfilled by a great epic. They are:

(1) That it concerns itself with action (that is to say not primarily with sentiment or reflection).

(2) That it should be *one* action (that is to say the attention of readers should not be distracted by many incidents, but the story should have unity and coherence as a whole).

(3) That the action should be a great action, that is that the theme should not relate to ephemeral incidents, but to those of permanent interest, and have in it something of the heroic and the sublime.

And in the whole history of literature, ancient and modern, there are but four or five poems which have fulfilled these conditions. Each of the great phases of the world's intellectual history has found its representation in an immortal epic. Homer's two great poems, the Iliad and the Odyssey, represent the earliest legends of the heroic age, and give to you with amazing force and vividness the manners, the beliefs, the conceptions of life which characterized the Greeks of the pre-historic age Virgil's Æneid was written in the Augustan age, the period of the highest prosperity and luxury of Rome, and while in its subject it dealt with the ancestry of Romulus and those traditions of which Rome was proudest in regard to the origin of their city and its policy, in its style it reproduces the tastes and the modes of thought of the age in which it was written.

Dante's great poem, the "Divina Comedia," takes for its subject one of the grandest of all conceptions. The description of the unseen world in its three aspects—Paradiso, the Inferno and the Purgatorio. I suppose it is because pictures of possible bliss and enjoyment are monotonous, while pictures of suffering and distress give ample scope and variety to an active fancy, that the Inferno is read more than the Paradiso, and is generally regarded as the highest effort of the poet's genius. But at any rate the poem stands first as the permanent embodiment of the belief of Catholic Christendom as it appeared to a cultivated Florentine in the thirteenth century.

Finally, there are Milton's two great epics, "Paradise Lost" and "Paradise Regained," which have for their theme a subject of the highest interest to humanity; which represent the convictions and the ideas dominant in Puritan England more than two centuries ago, and which for sustained sublimity, noble feeling, ripe knowledge, and imaginative power, deserve at least to rank with the great epics of former ages. Indeed there is no exaggeration in Dryden's famous epigram on Milton, as compared with Homer and Virgil.

Three poets in three distant ages born,
Greece, Italy and England did adorn,
The first in loftiness of thought surpassed,
The next in majesty; in both the last.
The force of nature could no further go,
To make a third she joined the other two.

Does it seem to you that the large thoughts and far-reaching speculations of the epic poetry are out of harmony with the pressing duties and cares of an active professional life? I hope not. Dr. Johnson once wisely said: "Whatever makes the past, the distant or the future predominate in our minds over the present, exalts us in the ranks of thinking beings." I think he might have added, "makes us understand the present better." The way to know our own place in the world is to think sometimes of the nature and destiny of the world itself. And the man who does not now and then nurture his mind on great thoughts, or thoughts that wander through eternity, and that concern the history and destiny of the race to which he belongs, is never able to see his own daily work in its true perspective, or to perform it with wisdom and success.

In the poetry of every nation there is some peculiarity in its metrical structure, which makes it address itself not to the understanding only but to the ear and to the sense of harmony. In English poetry there is the regular occurrence of similar accents; and after that the occurrence at intervals of similar terminal sounds which we call rhymes.

In Greek and Roman poetry there is the regular recurrence according to a recognized law of long and short syllables, and in lyric and dramatic poetry of strophe and antistrophe. Our earliest Gothic forefathers, in their rude versification, used to a great extent the artifice by which similar sounds recurred at the beginning of words; and alliterative verse, although modern ears are hardly attuned to it, probably fell as musically on the ear of a Norseman or a Saxon thane as rhymes fall on a modern ear.

The characteristic of the Hebrew poetry is the recurrence not of similar sounds, accents or syllables, but of similar ideas. Hence the duplicate character of the versification of the Old Testament.

> The heavens declare the glory of God, and the firmament showeth his handiwork.
> Day unto day uttereth speech, and night unto night showeth knowledge.
>
> He maketh me to lie down in green pastures.
> He leadeth me beside the still waters.
>
> Thy righteousness is like the great mountains.
> Thy judgments are a great deep.

As you read sentence after sentence like this in the Psalms, in the books of Job and of the prophets, you cannot help feeling how well this peculiar structure of verse lends itself to the expression of lofty thought and strong emotion; how much it has helped to deepen in the minds of those who heard it a sense of the majesty of the Divine works and of the spirit of devotion and of worship.

I have not spoken yet of that form of poetry which we call the drama. To this form of literary art some of the highest minds in all ages have been attracted, and if you consider it well you will see that intellectual gifts of a very special order are needed to make a great dramatist. Other writers stand apart from the subjects they treat; discuss them *ab extra*, and explain to you the light in which they view them.

The great dramatist on the other hand sinks his individuality altogether, projects himself into the circumstances and the character of the person he represents, so that he speaks through them and in their names only. In the early days of Greek literature the drama was a great religious institution, a great moral teacher. The actors were often priests, and the object of the representations were not to portray the scenes of actual familiar life, but to exhibit the lives of heroes and demigods, and the great passions which those lives illustrated. The whole conduct of the stage and the actors on it were highly artificial. There were only two or three actors; they spoke not in familiar dialogue, but in a tone of impassioned declamation; there was no change of scene, no interval of time: it was the function of the chorus to comment on the actors, to express sympathy with the sufferings and the contests of the actors, and to impress on the audience the moral significance which passed before them. The play, however, was no more like real life than a modern opera. Except in an allegorical and highly artificial way it was not a representation of life at all, but it sought to set the Athenian people thinking about the origin of good and evil, the conflict between them, the virtue of heroism and the relation in which man stood to fate and to the Gods

The modern drama has, as you well know, a more direct aim, and seeks to illustrate various phases of actual human life. The greatest name in our literature—the greatest name in all literature—is that of one who, except in a few sonnets, never reveals himself at all, and tells you nothing about his own feelings, purposes or opinions. He represents to you kings, clowns, clergy, statesmen, knights and fair ladies; and he puts into the mouth of each language so appropriate that you cannot tell which of these interests and pleases him most, or to which of their characters his own was most nearly akin. You can stand aside and criticise his characters, but he never criticises or admires, he simply creates the men and the women themselves and leaves them to impress you as they will. He shows no more indignation for Shylock, no more loathing for Iago, no more scorn for King John than those worthies felt for themselves. By an effort of constructive imagination which is the nearest approach in literature to the miraculous, he has been able to place his own mind so completely into the attitude of that of his characters that you lose sight of him altogether and see nothing but the actors on the stage, their thoughts and the doings of their life. Shakspere, as you know, was not a traveler. All his life he oscillated between Warwickshire and London, yet to judge from his writings he is as much at home in a palace in Verona as in the Boar's Head in Eastcheap. He had, so far as we know, little or no intercourse with foreigners. Yet in Othello, and Romeo and Juliet, you have vividly described the fierce passions which betray the Southern nature, and of which he in England could have had no experience. And the same marvelous gift which enabled him to realize distance in place and circumstance also seems to have given him an insight into the feelings and thoughts of another time. In his Roman plays he has caught the austere virtue, the peculiar superstitions, the high sense of honor and patriotism that characterized the best ages of Rome; and this was a very different moral world from that which surrounded him. Note, too, that the time of Elizabeth was not a speculative or doubting age. It was an age of healthy, robust, perhaps rather coarse prosperity. He, as a busy stage-manager, a jovial companion, could hardly have met with a character like Hamlet. Hamlet is essentially a nineteenth century character, moody, self-conscious, anxiously peering into the grounds of his own belief, and into the growth of his own character, "letting I dare not wait upon I would" and far more characteristic of the age which has produced "In Memoriam" than of the age which produced "The Merry Wives of Windsor."

In later days we have had many among our novelists, only three, as I think, which have exhibited, though in a more limited degree, similar power of vividly realizing the life and thoughts of a past age. Sir Walter Scott's Ivanhoe, Thackeray's Esmond, George Eliot's Romola, are the most remarkable examples of this power. There is hardly an anachronism in any one of these great books.

As I glance thus hurriedly at a few, though only a few, of the more prominent aspects of English literature, those who hear me are probably impressed with its wealth and variety, and with the vast store of experience which it comprehends. But the next thought, I hope, in the minds, especially of the youngar members of this association, is that they would like to share at least something of the great inheritance, and to acquaint themselves with a portion of it. And no one can settle for you what portion of it that should be. That must be determined by each student for himself in view of his own special tastes and idiosyncrasies. You have heard a good deal of public discussions as to what a young man should read, what are the best hundred books. There has been a pamphlet largely circulated in America containing a number of suggestions by eminent persons on this topic. Mr. Harrison has advised you to choose only the great authors. Mr. Balfour at Edinburgh has vindicated the usefulness of desultory reading. For both contentions there is much to be said. But after observing students all my life, I am, I confess, much impressed with this truth: That, provided you exclude from your reading that which is positively bad and pernicious, anything is good for you that you honestly enjoy. That which we read with sympathy and delight is far more likely to do us good, and germinate in the mind and to be a real help to our future development, than that which we read under the pressure of authority, or by the advice of friends, or with a view to get a certificate or to pass an examination. So my counsel would be: Choose that department of literature out of which you think you can get most refreshment and enjoyment, and cultivate it, even though you know it might not be the best for others who have different aptitudes and tastes from your own. We have not all the same appetites; we do not all desire intellectual nourishment from the same food, and this world would be a far less interesting world than it is if we did. But this general counsel to follow mainly in the choice of your reading your own instincts needs to be qualified by one or two considerations.

Whatever subject you find yourself attracted to, find out who are the greatest men who have written about it and put yourself in direct communication with them through their works. It is a good rule in study as it is in society, "Always keep company with your betters." Don't go to the second rate men if you can find access to the first We in this age are subject to special temptations in this respect. Our periodical literature is so abundant and on the whole so good that we are tempted to give our whole time to it. We read essays and criticisms about great writers, instead of going to the great writers themselves. Then we accept second-hand judgments of famous books and men instead of forming our own opinions about them. Now the river of Time has borne on its bosom many names and reputations which, after a short time, have sunk to the bottom in everlasting oblivion, while a few others have, by virtue of their intrinsic worth and nobleness, floated down through the ages, and are still on the surface. There is, of course, a strong presumption that books and authors, which have survived this test, are better worth your study than the mass of modern books which have yet to undergo the ordeals of centuries, and many of which will certainly be submerged ere long. And it is well to remember also that, so long as all your private reading is easy and pleasant, you are probably not doing justice to your own faculties and are giving your best power too little exercise You know how rapidly the eye glances over the columns of a newspaper, or the pages of a novel. There is no need for effort. Whatever stimulus your thoughts receive is slight and transitory. And if you try immediately to take up a book demanding a real effort of thought, say Butler's Analogy or Mill's Political Economy, you find the same amount of attention will not suffice. Your eye passes over the page with the same rapidity, and you find that you have gained no idea whatever. You have to go back and wind up your powers of concentration and intelligence to a very different pitch, and read the page again in a very different way before you can make anything of it, so whatever your programme of reading is, take care that it includes some one book at least which is hard, which challenges your best powers and demands a real effort of thought. An unused faculty soon becomes an unusable faculty, and he who allows his mind to drift, so to speak, occupying itself merely with what comes casually in its way, and is easy to understand, is allowing his power of fixed earnest attention to be wholly enfeebled, and will find when the occasion comes for a really serious mental effort that he is less and less able to make it.

It is a familiar truism that the mind is enriched and strengthened, not by the quantity we have read and learned, but by the extent to which what we read becomes the material for thought. Bacon said that "Reading maketh a man full," but unless reading is followed up by thinking the full man is very little the better for being full: and finds that his food has done nothing to increase his health and strength. Now, if a book which takes you two or three days to read is worth reading at all, it is worth at last half an hour's reflection afterward.

If you let the whole contents of a book pass at once from your thoughts, your reading has done little for you. It is in the subsequent reflection in putting to yourself the question, "Have I comprehended that author's meaning? Do I agree with his conclusions? If not, why not?" that the whole value of the book so far as it is a help to your mental development consists. The practice of writing down something about a book which has interested you—not a summary merely, not a number of extracts, but an epitome of the facts which have struck you most, and perhaps a criticism of its argument, is a very valuable one, because it forces you to turn over the whole subject in your mind again to ruminate upon it, and so to make what is in it a part of your permanent possession for life. It is from this point of view that I feel your Chautauqua reading circles to be of special value. They will, I hope, encourage each of their members when he has read a new book—say of poetry, history or philosophy—to write a paper or to give an account of its contents, and if possible to associate himself with those who have read it to discuss its merits. In this way you will not only provide every member with a new motive for reading but will also give to your own studies a coherence and a permanence which else might in the midst of the many intellectual distractions of a busy life be wholly wanting.

It may be that among those who hear me some are disposed to say I do not find myself particularly drawn towards any form of literature. I like work, I like society, but I do not care for poetry, nor for the products of what is called literary genius. To them I would only say: Rouse yourself, and try to care. In the long run the fullness, the richness, the happiness, and certainly the usefulness of a life depend on the number of interesting and worthy things which we do care about, and in which we take an honest interest. Your profession has claims, your family and friends have claims, but the highest claims of all are the claims of yourself for mental cultivation, for strength, for solace, for the means of true and honorable development. "Is not the life more than meat?" and there is not a truth in science, not a fact in history, not a sweet and graceful image in poetry which may not contribute to the strength of the inner life, and help to make you fitted for any duties, however mechanical or laborious, which may fall to your share. And the more mechanical and laborious the daily life is—the more prosaic and uninspiring the conditions under which our ordinary work is done—the more need there is that in our leisure we should resort to the company of the great and the wise, whose thoughts have enriched the world and made a nobler life possible for all their successors. As we look along the shelves of the great library and read the names of the famous writers we recognize in them the names not only of the world's greatest benefactors, but of personal friends, into the circle of whose intimate acquaintance we are permitted to enter. In that serene companionship the dullest life may be cheered, the meanest life may become ennobled. To them, as we claim our heritage in their thoughts and their works, we may say, as our eminent English poet, lately deceased, said of those from whom he had learned the most:

Servants of God, or sons,
Shall I not call you, because
Not as servants you knew
Your Father's most innermost mind,
His, who unwillingly sees
One of His little ones lost.
Yours is the praise, if mankind
Hath not as yet, in its march,
Fainted, and fallen, and died,
Then in the hour of need.
Of your fainting dispirited race,
Ye like angels appear,
Radiant with ardour divine;
Beacons of hope you appear!
Languor is not in your heart,
Weakness is not in your word,
Weariness not on your brow,
Ye alight in our van. At your voice
Panic, despair flee away.
You move through the ranks, recall
The stragglers, refresh the outworn,
Praise, re-inspire the brave,
Order, courage, return,
Eyes re-kindling, and prayers
Follow your steps as you go.
Ye fill up the gaps in our files,
Strengthen the wavering line,
'Stablish, continue our march
On to the bound of the waste,
On to the City of God."

An expert and experienced official in an insane asylum said to us, a little time since, that these institutions are filled with people who have given up to their feelings, and that no one is quite safe from an insane asylum who allows himself to give up to his feelings. The importance of this fact is altogether too little appreciated, especially by teachers. We are always talking about the negative virtues of discipline, but we rarely speak of the positive virtues. We discipline the schools to keep the children from mischief, to maintain good order, to have things quiet, to enable the children to study. We say, and say rightly, that there cannot be a good scholar without good discipline. We do not, however, emphasize as we should the fact that the discipline of the school, when rightly done, is as vital to the future good of the child as the lessons he learns. Discipline of the right kind is as good mental training as arithmetic. It is not of the right kind unless it requires intellectual effort, mental conquests. The teacher has a wider responsibility, a weightier disciplinary duty, than she suspects. The pupils are not only to be controlled, but they must be taught to control themselves, absolutely, honestly, completely.—*Journal of Education.*

Very Rev. Edwin Gilpin, D. D.

The subject of this sketch was born in Aylesford, N. S., on the 10th of June, 1821. Descended from a long line of illustrious ancestors, among whom was Bernard Gilpin, the "Apostle of the north," he is himself a typical English gentleman.

He was educated at Kings College, Windsor, at which institution he graduated in arts in 1847, and in divinity in 1853. In due course he proceeded to the degree of D. D., which was conferred upon him by his Alma Mater in 1863. In 1850 he was appointed to the head mastership of the Halifax grammar school, the only public institution for secondary education in the city. For a period of twenty-seven years he filled with unqualified satisfaction this important position, and during that time had under his instruction many lads who have since been prominent in the political, professional and commercial affairs of our city and country. In 1877 the Halifax grammar school was, by legislative enactment, merged into the Halifax high school, and Dr. Gilpin was appointed its first principal and classical master. When the high school became the county academy he continued at its head until his resignation in November last.

Dr. Gilpin has thus been before the public as an educationist for forty years. He was a born teacher and an ardent lover of boys. Very early in his career as a teacher, he read the life of the celebrated Dr. Arnold, of Rugby, and became thoroughly imbued with the principles which guided that prince among teachers. He made it a rule, as did his illustrious model, to trust his boys until they proved themselves unworthy of confidence. In the administration of discipline he invariably appealed to a boy's sense of honor, and thus cultivated a spirit of chivalrous manliness among his pupils. He had no trouble with tell-tales, and if a boy had not pluck enough to acknowledge a misdemeanour, he had no fear of being betrayed by his fellows.

As a teacher of classics, Dr. Gilpin has occupied the front rank, and his pupils have always taken a high position at college. When he began teaching, the rudiments of Latin were taught from the Eton grammar and Valpy's Delectus, but when occasion demanded it he had no hesitation in abandoning the use of these time-honored text-books, familiar, we may almost say endeared, to him by long association, and adopting others more in accordance with the progressive spirit of the age. By nature and habit strictly conservative, he yet availed himself of whatever he found valuable in modern methods of teaching.

As principal of the academy, where he had a staff of five colleagues, he was simply *primus inter pares*. He was scrupulous to a fault it may be, about interfering in any way in the affairs of the departments under the control of the several teachers, preferring rather that each teacher should be absolute in his own department. When a case of discipline was referred to him by any teacher the whole faculty was consulted. This course of action very much strengthened the hands of every teacher, as the pupils were made to feel that the faculty acted as a unit, and that an offence committed against one teacher was regarded as an offence against the whole staff. His delicate consideration of the views and feelings of his colleagues on all occasions won for him their entire confidence and unbounded esteem. They regarded him as a father and a friend rather than as a superior officer. His kindly and paternal bearing towards the pupils rendered him the object of their reverence and love.

In the performance of all his duties as a teacher, Dr. Gilpin was remarkable for his punctuality, regularity and strict adherence to system. He was not only never absent from duty, except through unavoidable necessity, but he was habitually at his post many minutes before the hour of assembling the school. When the hour arrived everything proceeded like clock-work, without delay or loss of time.

Perhaps no better testimony can be given to the doctor's ability and success as a teacher than the statement publicly made by Mr. MacKay, his successor in the principalship, to the effect that he had sought the doctor's advice in the management of the school and that he intended to follow it as closely as he could; moreover, that he had never met two hundred pupils more remarkable for the observance of good order than those he had found on assuming the head mastership of the Halifax academy.

Notwithstanding the arduous duties devolving upon him as a teacher, Dr. Gilpin has rendered admirable service to the church of which he is a distinguished clergyman—service which she has not been slow to recognize. For many years it was his custom to drive several miles into the country on Saturday in order to minister to a vacant parish on Sunday and return home in the evening to be ready for school next morning. Of late years he has been unremitting in his attention to the spiritual wants of the inmates of the Victoria Hospital and of the Poors' Asylum. As an alumnus and governor of King's college, he has ever been loyal to his alma mater, and has taken a prominent part in the counsels which have placed that institution in its present very promising condition. In 1864 he was appointed Canon of the cathedral church of St. Luke's, and in 1874 was made Archdeacon of Nova Scotia. In 1889 he resigned the Archdeaconate in order to accept the higher dignity of Dean of Nova Scotia. During the vacancy in the bishopric, occasioned by the decease of Bishop Binney, Dr. Gilpin was put in nomination by a strong party, and received a large majority of the votes of the clergy who knew his worth, but on account of his very pronounced views as a high churchman, the lay brethren withheld their support and he was not elected.

As a man, as a teacher, and as an ecclesiastic, the subject of this sketch has made his mark in the history of our province, and we trust that he still may be long spared to enjoy the leisure to which forty years of active service have justly entitled him.

Robert Browning.

Robert Browning is dead. Little that can be said will add to the significance of these four words in the ear of any man to whom has come a revelation of the virile spirit that, for nearly fifty-five years, has been chanting his message, sometimes in dark sentences, and sometimes in words as clear and piercing as the arrows of the sun, to people of English speech. It was in 1835 that Browning cast his first volume of poetry down before a public that had become accustomed to and content with the pretty fancies and purling rhymes of the "Keepsakes" and the "Amulets." His last book appeared on the day before his death; he had but time to hear that it had met with a favorable reception before he "faced hence." In that long interval he had wrestled with and conquered attention and applause by sheer strength of genius. The world may not be able to probe the depths of his sense, or even be prompt and unanimous in awarding him a place among the foremost poets of his day. But it has been compelled to recognize that his meaning is always worth the labor of seeking for it, and that in him was to be found one of the keenest and subtlest intellects and one of the most strongly marked personalities among those who have written verse. The world has lost in him what can never be restored. The courage, the vigour, and the vividness of his genius place him among the first ranks of men. Nothing either of daring or of vitality perished or decayed with age. His latest poems are as instinct with the fire and color of life, and breathe the same pure elevation of soul, and self-reliant fearlessness and hope that were displayed in his earliest book; and where there is change, it is in depth and clearness and grasp of his art. Singular to say, the genius of his contemporary, the other great poet of the Victorian era, also put forth late blossoms almost on the same day in which Browning's latest volume appeared, and on the very day of Browning's death. He sings as sweetly as ever; and there are lines that, with an alteration, might have been written for his brother bard—

All his leaves
  Fallen at length,
Look he stands,
Trunk and bough,
  Naked strength.

With the sap of life and love still breaking forth greenly in him there was in the end more than "naked strength" in the spirit of Robert Browning. He was an oak with the airy and musical spirit of Ariel "pegged in its knotted vitals" His own lines express him best. His first published poem opens:

I am made up of an intensest life.

The last lines of his latest message to his fellow-men ran:

"Strive and strive!" cry "Speed, fight on,
  fare ever
    There as here!"

These words are the Alpha and the Omega of the man, and the burden of his fifty years' singing. Though in some manner a citizen of the world and a student of those springs of emotion that lie beyond nationality, and though Italy, where he died, was the land of his intellectual love, he was in the fibre of his character an Englishman among Englishmen, proud of the country that was honored by giving him birth. No one can say what he owed to the kindred poetic soul that was knit with his in such intimate union, though in a dedicatory line, or a lyric here and there, he has half withdrawn the veil from the inner sanctuary of his heart to reveal what he lost in his wife. If, as he hoped, he is still "faring forward there," may we not think of Robert and Elizabeth Barrett Browning as gain united?—*Exchange.*

The Educational Institute of New Brunswick.

The Executive Committee, at a meeting held in Fredericton on the 2nd inst., reached the following decisions regarding the next meeting of the Institute:

PLACE—Moncton, provided satisfactory arrangements can be made; otherwise, St. John.

TIME—Thursday, 26th June, and two following days,—opening at 2 p. m. (standard) on Thursday, and closing about noon on Saturday. It is understood that the Saturday will be taken as a substitute day for Monday, the 30th.

BUSINESS AND SUBJECTS OF PAPERS—*Thursday Afternoon*—Routine business, including election of Executive Committee for the following year, and reception of reports of committees on revision of the constitution, superannuation of teachers, etc.

Thursday Evening—Public meeting. Platform speeches; address on Scientific Temperance Instruction.

Friday Morning—(1) Paper on "Professional Progress." (2) Paper on "English in Advanced and High Schools." Discussion to follow.

Friday Afternoon—Excursion by rail, probably to Point du Chene.

Friday Evening—Paper on "Patriotism—How can it be developed in Common Schools?" Discussion.

Saturday Morning—[Meeting of the Alumni and Alumnæ Society of the Provincial Normal School.] Paper on "A scheme for promoting pupils in graded schools where there is no local superintendent. Should advancement be determined wholly by written examinations?" Discussion.

N. B.—Travelling arrangements as usual.

HERBERT C. CREED, *Secretary.*

EDUCATIONAL NEWS.

The special committee appointed to complete arrangements for the Summer School of Science met in Halifax during the Christmas vacation. The School meets at Parrsboro from July 21st to August 2nd. The programme will shortly be announced.

The executive of the Educational Association of Nova Scotia have decided to meet in Halifax next year on the 29th, 30th and 31st December. This arrangement will leave the summer vacation unbroken except by the Summer School of Science.

During the Christmas vacation a large committee, consisting of the executive of the Educational Association of Nova Scotia and representative educationists selected from all quarters of the province by Dr. Allison, Superintendent of Education, discussed with much fullness and energy a number of educational reforms mooted from time to time at conventions and in the press. As the committee represented as nearly as possible every element interested in our educational system it was not surprising to learn that the discussions were interesting and sometimes vigorous. Yet there was not a single vote taken until the committee came to an unanimous finding. Such unanimity from such a committee means that the government will probably with as little delay as possible give effect to the proposed changes, which we understand are virtually as follows:

1st. The syllabus for the examination of teachers shall be assimilated to the course of study for the High Schools.

2nd. Grade D to correspond as far as practicable to first year work, Grade C to second, and Grade B to third year work in the High School course.

3rd. That the Council of Public Instruction grant certificates of graduation to those completing satisfactorily the High School course.

4th. That an adequate guarantee of professional knowledge and skill should be required of every candidate for license to teach in Nova Scotia.

The work of revising the course of study was referred to several sub-committees.

The work of co-ordinating the whole constructing course of study for miscellaneous and village schools, and model time tables was referred to a larger committee representing the sub-committees.

PERSONAL.

Mr. J. D. Seaman has been appointed principal of the Upper Prince street school, Charlottetown, in place of Miss Barr, resigned.

Reverdy Steeves, late principal of the Hillsboro (N. B.) Superior School has gone to South America on a trip.

We are glad to learn that Inspector Lay is improving although still confined to his bed, we are sorry to say.

T. C. Allen & Co., of Halifax, is about to publish a text-book of athletics and calisthenics for the use of our public schools. The author is the well known Sergeant-Major Bailey of the Imperial forces at Halifax.

F. M. Cowperthwaite, B. A., of the Bathurst Superior School, has removed to New Westminster, B. C.

Dr. Allison, Superintendent of Education for Nova Scotia, was presented with a valuable gold and ebony cane by the Nova Scotia Educational Committee at the closing of their Christmas vacation sessions.

Miss Bessie Narraway, A. B., of St. John, N. B., has resigned her position as preceptress of the St. John's, Nfld., Methodist College, which she has held for the past three years. In an address to Miss Narraway the College Board testified to her excellent services and their regret at losing so valuable an auxiliary.

Alex. Robinson, B. A., (Dal.) of Campbellton, N. B., has received an appointment to the principalship of the Vancouver High School, British Columbia —another bond between the Pacific and Atlantic provinces of our wide Dominion.

Cornelius Campbell, of Millcove, P. E. I., who is a student of Propaganda, Rome, has carried off the degree of Doctor of Philosophy. Mr. Campbell is a nephew of Archbishop O'Brien, and is to study for the priesthood of the archdiocese.

Stanley Bruce, son of Capt. J. K. Bruce, of Shelburne, succeeds Mr. Mackintosh as principal of the Lunenburg academy.

AMONG THE COLLEGES.

The Halifax Academy has enrolled about two hundred students. The course is divided into six classes, "A" adapted to those preparing for academic diplomas and advanced university matriculation, "B" for those preparing for ordinary matriculation in colleges and for candidates for Grade B or "first-class" teacher's diplomas, "C" for those preparing for C or second-class license, medical and law matriculation; "D" for those preparing for D or third-class teacher's license, preliminary civil service examinations, etc.; "E" and "F" leading up to higher classes and preparations for ordinary clerkships. It is free to all residents within the city and county of Halifax who pass the entrance examination, or to licensed teachers without examination.

PUBLICATIONS.

We have to thank Mr. M. Chamberlain, the Assistant Secretary of Harvard University, for a catalogue of that institution for 1889-90.

We acknowledge the receipt of a beautifully printed calendar and cards from L. S. Foster, 35 Pine street, New York—a fine mercantile stationery establishment with printing, lithographing and blank books; also handsome calendars for 1890 from Barnes & Co., St. John; Rhodes Curry & Co., of Amherst, and Daniel & Robertson, St. John. From the bookstore of E. Dentu, Avenue de l'Opera, Paris, comes a finely illustrated catalogue of French works, of great variety, and very cheap.

BOOK REVIEWS.

McMillan's Almanac, 1890, is filled with valuable information that no one can afford to be without.

Visible Speech and Vocal Physiology, by Alexander Melville Bell, 12mo., pp. 59 (N. D. C. Hodges, 47 Lafayette Place, New York; London, Trubner & Co.) An ingenious and valuable invention. A new thing. Every modification of muscle tension which controls speech articulation is indicated by elementary signs which can be readily compounded. Given one of these hieroglyphics, the trained visible speech reader puts the indicated muscles in motion and forth comes the speech represented by it. These signs of vocal elements must be a valuable invention for the physiological vocalist, the scientific orthoepist Provincial dialects, peculiar accents or the sounds and words of any language, can be expressed in concise mathematico-hieroglyphic formulæ; and conversely can be read out of them.

Shakespeare's Twelfth Night; London, MacMillan & Co., and New York. This is another of that excellent series of English classics published by MacMillan. The notes are excellent without being cumbrous or overloaded with details, and the volume is handy and clearly printed

Enunciation and Articulation. A practical manual for teachers and schools, by Ella M. Boyce; 12mo., pp. vi. + 88. (Ginn & Co., Boston, 1889). Miss Boyce is superintendent of the schools of Bradford, Pennsylvania. This simple book of exercises could be made useful in the hands of a skilful teacher.

Natural History Object Lessons; a manual for teachers. D. C. Heath & Co., Boston; mailing price $1.35. The object of this is to supply information from which the teacher may, with the least effort, prepare systematic courses of interesting and instructive lessons on natural history for elementary schools, and also to provide a sufficient number of specimen lessons to serve as guides in the preparation and construction of other lessons.

Papers on School Issues of the Day, Nos. I–III. Price 25c , 15c., 10c. Published by C. W. Bardeen, Syracuse, N Y. This is a series of the more important papers read before the National Educational Association in July last. No. I treats of Denominational Schools; No. II , of the Educational Value of Manual Training, and No. III , of Art Education the True Industrial Education. Nos. II and III. are from the pen of Wm T Harris, the new Commissioner of Education for the United States

Modern Language Series Messrs. D. C. Heath & Co. have recently published in their modern language series, Victor Hugo's "Bug Jargal," edited by Prof. Boielle, of Dulwich college; and Holberg's "Niels Klim's Wallfahrt in die Unterwelt," edited by E. H. Babbit, Professor of German in Harvard.

RECEIVED.

Lindner's Empirical Psychology—DeGarmo. (D. C. Heath & Co)

AMONG OUR EXCHANGES.

The *Popular Science Monthly* for January gives evidence of increased attention to live topics of the day. "Public Schools as affecting Crime and Vice" is the subject of an essay by Benjamin Reece, who brings figures to show that as illiteracy has been diminished crime has actually increased, and concludes that some effective teaching of morality should be included in our system of education. In a "Harvest from the Ocean," Prof. C. M. Strahan tells how certain important substances are derived from sea weed....The January *St Nicholas* fully sustains the promise that it was to be virtually a second Christmas number. A story "Tracked by a Panther" is contributed by Prof. Roberts. ....The January *Century* has a frontispiece portrait and sketch of Prof. Jas. Bryce, the author of "The American Commonwealth." A curious and valuable paper is that by Prof. Edward S. Holden, of the Lick Observatory, telling of a recent discovery of his concerning "The Real Shape of the Spiral Nebulæ."....The *Scientific American* begins a new volume with January. It is not easy to estimate the educational value of a paper like this coming into the household every week. See advertisement in another column for what it promises for another year, and these promises it will certainly keep....The *Youth's Companion* double Christmas number, was a charming souvenir and interesting to readers of all ages....The students of St. Martins, N. B., Seminary issue a very attractive initial number of a monthly journal to be known as the *Seminary Bema.* ....The Moncton *Times* recently celebrated its twenty-first year of vigorous growth by the issue of a magnificent special edition, which is a history of Moncton's industries and progress....*Garden and Forest* began its third volume on January 1st. It is growing in interest and value. It treats not only of the science of gardening but of all subjects interesting to horticulturists and lovers of nature....The *Bookmart* for December publishes among other interesting matter a hitherto unpublished essay by De Quincey on "Novels."....The *Herald of Health*, New York, contains many valuable suggestions how to preserve the health of mind and body....The *American Geologist* for November contains the following among interesting original articles: "Mathematical Theories of the Earth," by R. S. Woodward; "Geology in the High Schools," by Victor Clifton Alderson; "The Photographic Survey of a State," by Moritz Fischer; "Chemical Origin of Iron Ores," by Winchell, and "Review of Recent Geological Literature."....The *American Naturalist* is still tardy in coming out of the publisher's hands It gives an admirable summary of natural history news....The *Microscope*, as edited by Dr. Stokes, is better than ever....*Science* comes weekly with its budget of fresh contemporary scientific news and discussions....*L'Enseignement Primaire*, of Quebec, enters on its eleventh year with more vigor than ever.

McGILL UNIVERSITY,

MONTREAL.

The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 16th. 1889).
Donalda Special Course for Women—(Sept. 16th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
Faculty of Medicine—(Oct. 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

UNDER the head of "Educational Opinion" will be found from time to time several short paragraphs from a capital abstract in the Halifax *Herald* of the report of Supervisor McKay on the Halifax Schools for the year 1889. No American educationist is more energetic in his work, more cautious in coming to his conclusions, and clearer in discovering the drift of the age than Mr. McKay. His views are therefore not only valuable for the teacher, but for those who are directing or influencing public educational anywhere.

THE natural history subjects hitherto treated in "Ferndale School" lesson may shortly be resumed in a systematic and concise outline for the use of teachers and pupils, under such titles as "52 Common Insects.' "52 Common Birds."

THE New Brunswick Natural History Society has lately purchased the museum of the St. John Mechanics' Institute, embracing a most valuable collection of natural history objects. This, with the large collection that is already possessed by the Society will make its museum a valuable one to students.

AS USUAL during the last few years a very interesting and largely attended institute of teachers was held in Amherst just before the Christmas vacation. We regret that we were unable to obtain a summary of the work in time for the January number.

WE ARE glad to observe the success with which the Pictou Academy is bringing good musical instruction down to a minimum cost by the class system. The musical department has four classes, namely, Piano, Voice Culture, and Harmony, under the charge of Miss Annie McDonald, a distinguished graduate of the New England Conservatory; and the Violin, under Miss MacKinlay, a pupil of the famous Julius Eichberg. The Academy Calendar gives an outline of the curriculum of the various classes. It covers essentially the first three grades of the New England Conservatory in Pianoforte and Voice Culture. Class and public recitals are given at the end of each term of three months. From the Pictou papers we gather that the public recital, January 30th, was a very creditable showing. A list of the standing of pupils in the various classes are also regularly published. From personal knowledge we know that nowhere is more thorough work done.

DR. T. H. RAND, who is spending the winter in London, contributes an article in the last *Messenger and Visitor* on the funeral of the late Robert Browning in Westminster Abbey. The impressive ceremony is described in language that is touching and poetic, and will be read with interest by Dr. Rand's many friends in these provinces.

A LITTLE PAMPHLET, "Kingston and the Loyalists of 1783," just issued from the press of Barnes & Co., by W. O. Raymond, will be read with great interest, containing, as it does, so many reminiscences of the early history of New Brunswick. It narrates events in the life of Walter Bates and other loyalists, and contains portraits of Right Rev. Charles Inglis, first bishop of Nova Scotia, and of the Right Rev. Bishop Medley. Rev. Mr. Raymond, to whom the public are indebted for editing and publishing this pamphlet, has a short introduction, and his notes will be of great service.

HIGHER EDUCATION IN NEW ENGLAND.

We gladly acknowledge, with thanks, the courtesy of Mr. Ray Greene Huling, the secretary, in sending to us the report, a model of neatness and careful editing, of the fourth annual meeting of "The New England Association of Colleges and Preparatory Schools" held at Boston on 11th and 12th October, 1889, and comprising in its membership the most eminent teachers in the universities, academies and high schools of New England. This Association presents us, in its proceedings, not only with the latest but most authoritative and weightiest expression of educational opinion on the continent, upon some of the most keenly discussed questions of the day, and it is interesting and instructive to observe that the topics which engage their attention were chiefly those to which the minds of leading educators in our own country are directed. They, as well as we, are anxious respecting the qualifications of the teachers in secondary schools; they wish to arrive at some common understanding upon the subject of examinations for entrance to the university, and express sympathy with the desire that an effort be be made provide instruction in elementary science in schools of all grades. The addresses and reports are of an exceedingly practical character and are distinguished throughout by breadth of view, knowledge, good sense and moderation.

In one paper a plea is advanced for the provision by universities of professional training for teachers of secondary schools. From the degree of support which the views of the writer evoked, we may reasonably infer that the members of the Association have great faith in pedagogic training, yet it is very satisfactory to note that a liberal and thorough education is regarded by them as indispensable and as providing the teacher with his necessary equipment. "College education," says President Dwight, "can and ought to give the graduate the knowledge, and if possible, the common sense which will enable him to use it. Then let him practice. The man's individuality must be his chief reliance."

Perhaps, to us, the most interesting discussion is that upon the subject, "Should Homer be taught in the preparatory schools?" and we may not be at fault in supposing from the space devoted to the report of the leading papers and the speeches on the affirmative or negative side of the question, and the prominent position of the speakers, that it was equally interesting to the Association. We must confess to a good deal of sympathy for the views of Dr. Keep and his supporters. We cannot imagine anything more dreary for students in classics at this stage than to be condemned to read three or four books of the Anabasis without any relief. Young men are sufficiently acquainted with Greek syntax, after a thorough study of one book of Xenophon to commence the Iliad or the Odyssey. We never knew of any tyro in Greek being fascinated by the Anabasis, but scarcely any one reads either of Homer's works without being in some degree conscious of his power to arouse an interest in the narrative and some appreciation of the style of poetry. Nor need there be any fear lest the student lose ground in Attic Greek by the study of an author who writes in a different dialect, for the Greek composition which occupies part of his time will be sufficient to prevent it.

The existence of this Association, the utility of the subjects which are discussed and the ability and varied experience of its members, must exert a beneficial influence upon the higher education of the New England States.

ENGLISH LITERATURE IN THE COMMON SCHOOL.

An example of good work of this kind we observed on Friday afternoon, preceding the Christmas vacation, in the vice-principal's department in the Morris Street School, Halifax. Ten minutes a day during the past year were devoted to the study and memorization of short poetical passages, together with the date, country and chief work of the author. The children at home had much pleasure and educative amusement in searching for striking poetical gems to be presented for selection by the teacher. The result was the memorization of some 344 of the most beautifully expressed thoughts in the English language, with an outline sketch of about seventy noted authors. Without an instant's hesitation, some sixty or seventy such quotations followed each other in a ceaseless fascinating stream, well recited, author and work stated, all in obedience to the motion of the teacher's eye. This was only a part of the interesting programme, but the one which interested us most. The Superior, the Secretary and the Chairman of the School Commissioners were present. With most judicial ruthlessness, the Supervisor, before expressing an opinion, continued the examination by asking for specimens of the poetry of certain authors with some leading points in their history. The result showed that the pupils had one or more illustrations of the poetry of a great number of authors ready at hand with an outline biographical sketch. Here was being laid a real, practical and useful foundation of English literature—useful for present purposes and the best preparation for more advanced work. And only ten minutes a day were absorbed!—and not a wearisome or uninstructive ten minutes. Then, how much was read at home in the literary game of digging in the poems for the brightest gems and hunting in encyclopædias and reference books for biographical sketches? And what a store of beautifully coined thoughts had each pupil in this school! Over three hundred apiece—as many as some writers have in their book of quotations and two or three hundred more than they hold in their heads. We recommend the consideration of this method to our teachers from the charming illustration which we so much enjoyed ourselves.

HOW THEY WORK IN HALIFAX.

We think it right to publish the following circular to the Halifax teachers in order to keep our readers posted in some of the forms of activity in advancing the status of the profession in these provinces. In Halifax the teacher must always be a student under the present regime.

[Circular.]

A meeting of the Halifax Teachers' Institute will be held in the Academy on Friday, the 24th inst, at 4.30 p. m. A full attendance is particularly requested.

As the next meeting of the Provincial Educational Association will not take place during summer holidays, teachers will have an excellent opportunity of devoting their attention to science at the Summer School at Parrsboro In preparation for that important work, Principal MacKay will give several lectures on Zoology this winter. He will enter somewhat fully into the discussion of some typical vertebrate and perhaps some molluscs. Mr. Kennedy, who lectures on Chemistry at Parrsboro, will give a course of lessons on Williams' New Chemistry, together with practical work from the Laboratory Manual of General Chemistry. Miss Ryan has been appointed teacher of Tonic Sol-fa for the Summer Science School. Miss Creighton is again assistant in Botany, and another young lady from the Halifax schools has been appointed assistant in Mineralogy —so that these subjects will receive some attention from us. On Friday we expect to form classes and make arrangements for the winter's work.

Let me add a few words on a most imporant question, How should we spend our vacations? Too much sleep is said to be productive of serious injury. Similarly an entire cessation of mental activity during summer holidays causes a relapse into habits of intellectual lethargy which it took years to overcome. A month of every fall is required by some teachers and all pupils in recovering from the dissipating effects of summer holidays and in getting back to habits of study If we would be healthy in mind and body what we all need during holidays is change of scene and change of occupation. How delightful, healthful and refreshing the change from the confinement, the book-work and the memory-cramming process of the school-room to the open field work, the laboratory processes and the sympathetic companionship of the Summer School. Let us all go fully prepared to enjoy it and profit by it

At this meeting, in addition to the formation of classes as explained above, short addresses on the Teaching of Temperance in School will be given by three very able advocates of temperance. Dr. Maria Angwin will consider the scientific principles involved; Mrs. Bell, the moral principles, and Miss Oliva Ritchie, B L, Ph. D, will make the practical application.

Yours faithfully,
A. H. McKay,
Supervisor.

Halifax, 21st January, 1890.

EDUCATIONAL REFORM.

In our December number we called the attention of our readers to the true aim of education; we noted the almost insuperable difficulties which, under present conditions, prevent the realization of a high ideal in education, and expressed our deliberate opinion, that until the occupation of a teacher becomes a real profession and stipends are commensurate with the nature of the duties which teachers are required to discharge, there will not and cannot be assured to the community those advantages which, in the words of Milton, are "to fit them to perform justly, skilfully and magnanimously the office of a citizen." It is not by an organization, however perfect; it is not by constant tinkering of the course of studies; it is not by speeches on its paramount importance, and the transcendent interests that are entrusted to the teacher, that the education of the country can be made worthy of the name. We may, with some degree of confidence assume that the systems of education operative in these provinces are upon the whole satisfactory to the people and responsive to the requirements of enlightened educational opinion, that a sufficiently full, fair and manageable programme of studies has been arranged, and that the people are generally alive to the value of a good education. Much more, however, is needed before the hopes of the educational reformer can be realised. The machinery is provided but the results depend upon the skill with which it is worked. The success of an educational system must depend largely or entirely upon the devotion, intelligence and energy of the teachers.

We are told, time and again, from the platform and in the pages of the newspaper and the magazine, that the profession of the teacher is surpassed by no other in dignity and responsibility; but we are not aware that any supreme effort has been made to enable the teacher to live in a manner becoming the position that has been assigned to him. The stipend of a clerk in a store is held to be quite sufficient to remunerate the country teacher, while book-keepers in business establishments receive higher salaries than those who are the head masters in our large city schools. The able and ambitious clerk looks forward to a business of his own, while the principal of an academy or high school has no further prospects of promotion within the limits of his profession. Is it to be wondered, then, that the teacher, after a short experience, abandons the business and adopts a career which affords greater scope for his energy, talent and enterprise, and offers more liberal inducements to those who adopt it?

Or, if we compare the teacher's position with that of the officers in the various departments of the public service we are struck by its inferiority. How much more generously are the officials of all grades treated by the state than the teachers are by the people? Not only are they liberally remunerated whilst engaged in active duty but they have the prospect of superannuation when age brings infirmity and its attendant disabilities. The teacher, on the other hand, has never had but a stinted allowance and is not encouraged and stimulated by the hope that provision is made for his declining years. It generally happens that when he is advanced in life younger men are preferred by school committees and he is thrown upon the world or his friends, too often neglected by the public whom he has served; or at best receives the pittance of the mendicant when his maintenance ought to be esteemed a public and pressing obligation.

As long as this is the case can it be expected that men will join a profession which has so few advantages to offer? Profession! We have used the word repeatedly, but it is really a misnomer. The few at the head who have made teaching the business of their lives cannot constitute it a profession. The vast mass of those engaged in teaching use it for their own purposes Their heart's affections and aspirations are centered elsewhere. To them it is but a stepping-stone to something else, a mere incident in their lives, an occupation which too many regard as scarcely serious, and which, not a few, in after years, recall with impatience and strong dislike. So long as teachers feel bound, in their own interest, to make their connection with education a temporary arrangement, so long as they look elsewhere for a career, and other objects win their sympathy and rouse their ambition, so long will teaching remain an *occupation* and come short of possessing the necessary elements of a *profession.*

Do people understand or seriously consider their relation to education and the teacher of the public schools? Do they ever realize the fact that the parent has in great measure transferred to the teacher the responsibility of training his children? He does not hesitate to entrust him with the duty of instructing them, of forming their character, directing their energies and influencing their judgment; and yet we do not always discover in him a profound anxiety to procure such men as can safely have committed to them a charge of such moment. The parent appears to forget that the task of the teacher is no mere mechanical operation, requiring only ordinary intelligence, industry and reliability, but that success can only be assured to him who is gifted with the faculty of discernment of character, and is possessed of a cultured mind and a power to interest and stimulate. He has to deal with minds, not with materials; and hence the necessity for special preparation and the existence of conditions favorable to the prosecution of his enterprise. To influence studious, thoughtful minds, the teacher must be a student himself, and must address his pupils from the fulness of his own mind and the maturity of his thought. It is only the man who is refined in mind and heart who can successfully sow the good seed in the minds of the young and cherish and direct its culture.

Such teachers are not equipped for their duties by the hurried and intermittent training of the present day. But why should we be surprised if we discover a lack of scholarship, culture and skill in many of our teachers? Can we expect to procure the services of first-class men in return for such salaries as we offer? Should we be astonished if educated and cultured men refuse to undertake the performance of a duty, delicate and involving eternal issues, for a recompense less than would be that of a skilled mechanic in these provinces or a policeman in the neighboring republic? The same law holds good in teaching as in commerce — the higher the price you offer the better an article will you obtain — the better the salary you offer the more competent the teacher you will procure.

But it has been the custom to regard the teacher— particularly the high class teacher — as if he were different from other people, and ought to be paid by a standard not applicable in other cases. He is supposed to be a man of inexpensive habits and contented mind, whose ideas and ambition are bounded by his school, and whose tastes and sympathies are domestic and literary. There is doubtless much truth in this, but we fear that necessity rather than choice accounts for much of the self-discipline which has led to this result. The outcome is good, but we question the justice of basing an estimate of a teacher's needs upon an economic condition which is the resultant of compulsion on the one side and a philosophic submission to circumstances on the other. Just as we emphatically condemn the infinite meanness of advancing as an argument for the acceptance of a small salary, when twice the sum could be as easily paid, the habitual unselfishness of teachers and their devotion to their duty irrespective of remuneration. When these liberties are taken with teachers it is time for them to assert their claim to more generous treatment — to let the public understand that an accomplished and competent teacher can only be obtained upon the same terms as properly qualified men in other departments of activity.

Moreover, teachers do not profess to constitute a brotherhood vowed to poverty, celibacy, and self immolation. They have not cast behind them the comforts of life and its interests. They are citizens of a dominion free and young, in whose advancement they rejoice, to whose stability they contribute, and of whose honour they are jealous. As members of the community in which they are placed they ought to be in circumstances to associate on equal terms with those to whom they are commended by their position and acquirements. Independence begets respect, knowledge and good sense are appreciated, and the public estimate of a teacher as a member of society augments his influence in the class-room and contributes to the weight of his opinion.

We have addressed ourselves, in the first place, to the financial question, because it lies at the root of all reform. And we have done so not from mercenary motives, certainly, as will appear to all who dispassionately examine the circumstances of the case, but because teachers are entitled, when estimating the value of their services, to take into consideration the time spent and the expense incurred by them in fitting them for their profession, the position in society which they are expected to fill, and the rewards which await men similarly gifted in other professions. Our remarks have not been solely directed by a desire to advance the interests of the teachers but to promote the cause of education — to prevent or diminish the constant efflux of good men from the profession at the time when they are most valuable, and to induce others to join the ranks who are at present deterred from doing so. Let our academies and high schools be placed upon such a financial basis that they will be regarded as prizes worth striving for, and let the salaries of the teachers in the other schools be increased in proportion, and, with the excellent material which has been proved to exist in the Atlantic Provinces, and their abundant and admirable facilities for higher education and professional training, we may reasonably hope for the commencement of a brighter era in our educational history.

Astronomical Notes.

A correspondent writes: "I have frequently read and heard of the forenoon being longer or shorter than the afternoon, and I have recently listened to and taken part in quite a lively debate on the subject. Would you kindly inform me if the forenoon and afternoon are of unequal length; and if so, why so?"

The categorical answer to the first question is: Yes, and No. It depends on where you live and what time of year it is.

I had got thus far with my answer, when it suddenly occurred to me that the forenoon and afternoon that I was thinking of might not be the same as those that my correspondent was thinking of. So I determined to try to find out what people usually meant by these terms. The vague, loose, general way in which they are used nineteen times out of every twenty will hardly serve our present purpose. To settle which of the two is the longer we must have them defined very precisely. This precise exact meaning of *Forenoon* and *Afternoon* is what I set myself to find out. I spent an afternoon at it and consulted a large number of people of all sorts and conditions. The result was that I found more than fifty varieties of the article—more than fifty varieties of forenoon and afternoon as precisely defined by the persons to whom I applied.

Now it is clearly out of the question that I should describe all of these and answer the above question for each. Even if I did so, my correspondent might not be satisfied, for his particular brand of forenoon and afternoon may differ from each and all of those in my collection.

If he will tell me exactly what he means by forenoon and afternoon I will try to answer his questions.

Almost everyone has a neighbor whose watch keeps time with the Sun. Either it is a very bad watch or its owner is a very bad man; for the Sun is not a very good time-keeper. Navigators and others who take time from him have always to turn up the almanac and find out how much he is ahead or behind. Even a toy watch, which does not go at all, is right twice a day, but the Sun is right only four times a year.

February is one of his worst months. When it is noon by him on the 11th it will be 12.14½ by a watch showing correct mean time. Three months ago Sun-noon fell at 11.44. So during these three months the Sun has lost over half-an-hour. During the same three months he has been travelling at his fastest rate on his annual journey among the stars. If it seems strange to you that these two things can have been going on at the same time, it will probably seem stranger to be told that his lagging behind as a timekeeper was due (not wholly but very largely) to his pushing ahead as a star-wanderer. It is so all the same, and why it is so is not a difficult matter to think out when once you get a good grip on the facts involved. The Sun is now pushing eastwards at a more moderate rate and the other cause of his losing time is also moderating its force. After February 11th he will begin to gain time and in the next three months will gain over eighteen minutes.

And so we see that for a watch to keep time with the Sun, from November to May, it must manage to lose thirty minutes during the first three months and gain eighteen minutes during the next three. Then it must lose ten minutes between the middle of May and the end of July, and gain twenty-three minutes between the end of July and the beginning of November. And all this irregular see-sawing must be regularly repeated every year. We are told that miracles are not impossible, and therefore there may be such watches, but "A hae ma doots."

Of course it may be said that the Sun's time-keeping is regular and that it is our mean or standard time-keeping that is irregular. This brings up a very important and very interesting question, but it is too large a question to be disposed of in a paragraph of notes.

The Star of Bethlehem is to appear again this year. At least, so say some of the newspapers, giving a telegram from Vienna as their authority.

There are several Stars of Bethlehem.

First there is the brilliant object which late in 1887 and early in 1888 was seen in the east in the early morning shining with such surpassing splendor as to be visible to the naked eye even after sunrise. At least, so said many honest and intelligent people who claimed to have seen it with their own eyes. They knew it was the Star of Bethlehem because they saw it "in the east," and because the newspapers had been telling them for months before that this star was to appear. At the end of the present year and during the first two months of next year there will be seen in the southeast in the morning a star of surpassing splendor, and this will be the very same star which caused such a sensation in the fall of 1887. If any one chooses to call it the Star of Bethlehem and finds that he derives any spiritual or other comfort from so lying about it, perhaps it will be as well to leave him alone.

Then there is the Star of Tycho Brahe, the great New star of 1572 which flashed out brighter than Venus for a time and then faded away again. This is the star which the newspapers of three years ago called the Star of Bethlehem and said was to re-appear in the autumn or fall of 1887. It did not appear in 1887, or in 1888, or in 1889. Perhaps it will appear this year. Perhaps it will not. I wish it would; I would like to see it.

Thirdly, there is the real Star of Bethlehem, mentioned in the second chapter of Matthew. I don't know that this star is not going to appear this year, but, even if it does, I don't just see how we are going to prove that it is really itself.

It is the second of these whose re-appearance is predicted for this year in the telegram from Vienna. I don't know how the newspapers know that Tycho's Star is the Star of Bethlehem. And I don't know how they know that either of these stars re-appears at regular intervals — as Mira does for instance. These things may be true, but it seems strange that the astronomers should know nothing about them. In fact, so far as my knowledge goes, the astronomers say these things are not true—at least are not known to be true. Still there may be something in the telegram. Tycho determined the position of his star as accurately as he could with the instruments he had. There are several small telescopic stars near the given position, any one of which may be Tycho's. One of these may have recently shown signs of brightening up. This much of solid bottom the Star of Bethlehem story may have.

Several of the Asteroids are in good position for observation now and will be for the next few months. If I knew that any of my readers had taken the trouble to find and follow Neptune from the directions given in December's Notes, I would this month give similar directions for Vesta, and in April for Pallas, Ceres and Juno. But it costs some little time and trouble to draw up such directions, and I don't care to give even this little to the work unless I was sure that somebody would be benefitted by it. If any one wants this sort of thing it can be had for the asking.

The "C" which has appeared under these articles was first put there by the editors. I continued it. But it seems there's another "C" who sometimes writes for the Review. To prevent mistakes I shall hereafter place under my contributions

A. Cameron.

Yarmouth, N. S.

We noted some time ago that the Halifax Academy adopted the Roman or phonetic pronunciation of Latin. Acadia College has adopted this pronunciation, we are informed; and the far-famed Horton Academy, under the principalship of Mr. Oakes, is about to follow in the same line.

For the Review.]

A Geographical Curiosity.

How frequently do we hear the complaint that the provinces are misrepresented abroad! Even the judicial Encyclopædia Britannica has not been entirely satisfactory to all in this respect, but its errors (if any) are, doubtless, unintentional. Very innocent, too, of any intention at misrepresentation, though erroneous notions it did certainly give in England, was that most delightful book—far the best that has yet been written on forest-life in New Brunswick—Lieut. Governor Arthur Gordon's "Wilderness Journeys in New Brunswick."* Then we all know how certain harbors and coast-waters have been misrepresented abroad, their dangers exaggerated and their advantages belittled. In all of these cases we can trace an object or a cause for the deception. But never, it can be safely asserted, has so much geographical error, as to our provinces, been condensed into so small a space as in the little work described below. Fairly good maps must have been at the command of the writer (we know of several published before 1800 which show correctly all that he describes so badly), and we are quite at a loss to explain the cause of his vagaries. But let them speak for themselves.

The book is a little 18mo., printed in brevier type, as the advertisement tells us, containing 288 pages. It is entitled, "A Geographical View of the British Possessions in North America," comprehending Nova Scotia, New Brunswick, New Britain [*i. e.*, Labrador], Lower and Upper Canada, . . . with an appendix containing a concise history of the War in Canada to the date of this volume. By M. Smith, author of the "View of Upper Canada." Baltimore; printed by P. Munro for the author, 1814.

Our author gives in the preface a short biographical sketch, after which he throws some light upon his sources of information. "What relates to Upper and part of Lower Canada, is written from actual observation, but what relates to the other parts of British North America I have principally collected from other writers, viz.: *G. Heroit, Esq.*, *Winterbotham, Carver, Mackenzie and Payne*, as also from some French authors, and old manuscripts taken by the Catholic missionaries among the Indians when the country belonged to the French. Through all these works, and some others, I have waded with considerable labor in order to collect such information that might be correct, beneficial and amusing to my readers, and although I do not pretend to say that this work is entirely void of *errors*, yet, upon the whole, I think it may be depended upon."

The chapters on Upper and Lower Canada appear to be fairly accurate. Coming to New Brunswick, the author tells us it is "with propriety reckoned more healthy than Nova Scotia," though he does not tell us by whom it is so reckoned. The Nipisiguit River, he says, sometimes called the Avon or Piguiguit, heads in two branches and runs a north-east course into the Miramichi Bay.

"The *Kenectoct*, *Cœmigun*, *Cœagut* and *Cobeguit*, in the County of Hants, are rivers of less note, falling into the river Avon, which empties into the Miramichi Bay."

"The *Percuid*, *Canaid*, *Cornwallis* and *Salmon* Rivers, in the County of Kings, are of some note." He then describes very correctly the numerous rivers flowing into the head of the Bay of Fundy, and he proceeds to tell us "the River *Restigouche* and the *Madawaska* empty into the St. Johns, above the great falls." The real Restigouche he call the "Rescong e" and places it correctly. He then gives some real information about the fish and the Indians, and describes Fredericton, which he tells us properly is on the St. John. Immediately afterwards he says, "*Cornwallis* and *Howe*, on the same river, are small villages." The fortifications of the province consist of Cumberland, Howe and barracks, enclosed in a stockade at Cornwallis." One of the occupations of the people of New Brunswick is "catching fur." We are then told, under the head of *Civil Divisions*, that "New Brunswick is divided into four counties, viz.: *Cumberland*, *Hants*, *Sunbury* and *Kings*, and eighteen townships." The location of these counties is most absurd. Take this as a sample: "*Hants* is still to the north-west, joining the Chaleur Bay, and contains three townships, viz.: *Windsor*, *Falmouth* and *Newport*." Sunbury County is described as it really was shortly after New Brunswick was set off as a separate province from Nova Scotia, in 1784. We are not giving all the remarkable statements of this remarkable work but the typical ones. There is a great deal also of really correct information given in it.

Here is a note coming under the heading of "Curiosities," which will interest those of our readers who live by the sea. The shell-fish procured in the month of August from the rivers and from their mouths near the coast, in the vicinity of the Bay of Chaleurs, are so highly impregnated with a poisonous quality as to occasion almost instantaneous death to those who eat them. The cause of this circumstance remains yet to be ascertained. The greater the diminution of these rivers the stronger the poison of the shells." Our students of mollusca find nothing of this kind to-day, according to the latest work on the subject.

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*Published originally in Galton's "Vacation Tourists," Vol. VIII., 1864, London and Cambridge. Reprinted the same year in St. John by J. & A. McMillan.

The "Description of Nova Scotia" gives us some interesting information also. In giving its situation and extent it is said to be "about 212 miles east north-east from Boston." Even at that early day Americans sometimes located the remainder of the earth with reference to Boston.

We are told that "the hill on the side of which Halifax is built is the highest in the country, being 330 feet above the level of the sea." Haligonians need not be too elevated by this, however, for we are soon informed that Nova Scotia is "considerably overspread with fogs for several months in the year." The rivers of the province are said to be the "*Skebenaeedie, Pitcoudiag* and *Memrencoot,* in the County of Halifax." We would expect from this writer some startling height for the famous Fundy tides, but while stating that they rise higher here than perhaps elsewhere in America, he mildly places their height at about fifty feet. Annapolis, he tells us, "is situated on the west side of the harbor of Lunenburg," though he locates it correctly in another passage. As to the people,—"notwithstanding the deplorable state of morals among the generality of the inhabitants of Nova Scotia, there are a considerable number of people whose conduct and conversation are very decent and orderly," Again, "the people of Nova Scotia are not generally religious." He had spoken more favorably of the people of New Brunswick.

The book gives us the impression of having been written from memory, and a very bad memory, after some reading of different works. W. F. G.

For the REVIEW.]

Proposed Changes in the N. S. School System.

Under the sanction of the Provincial Teachers' Association of Nova Scotia a committee of ladies and gentlemen whose names are given below met in Halifax during the Christmas vacation to consider certain changes in the school system, which were under discussion during the sessions of the last meeting of the Association.

This committee, after prolonged deliberation, adopted by a unanimous vote in each case, resolutions to be reported up to the Association, affirming that in their opinion the following changes should be made:

FIRST. That the Course of Study prescribed for High Schools, and the syllabus of examination for licenses of various grades should be so assimilated as to constitute in effect but one course.

SECOND. That on completion of the High School Course students should be awarded graduation diplomas by the Education Department.

THIRD. That the non-professional requirements for licenses of Grades D, C and B, should conform as nearly as possible in character and extent to the work of the first, second and third year, respectively, of the High School Course.

FOURTH. That an adequate guarantee of professional knowledge and skill should be required of every candidate for license to teach in the schools of Nova Scotia.

After a good deal of discussion upon various features of the courses of study for common and high schools, it was decided to assign the work of revision, with which also this committee was charged, by departments to various sub-committees constituted as follows:

Classics. Rev. Dr. McNeil, St. Francis Xavier, Antigonish; J. B. Calkin, A, M., Normal School, Truro; Robt. McLellan, A.B., Pictou Academy, Pictou.

Science. Alexander McKay, Supervisor of Schools, Halifax; A. H. MacKay, B.A., B. Sc., Halifax Academy, Halifax; E. J. Lay, Inspector, Amherst; H. S. Freeman, A.B., Amherst Academy, Amherst; Miss I. M. Creighton, Halifax.

Mathematics. F. H. Eaton, Normal School, Truro; A H. MacKay, Halifax; Robt. McLellan, Pictou; Dr. McNeil, Antigonish; Miss N. A. Burgoyne, Windsor.

English Language. I. B Oakes, A.M., Horton Academy, Wolfville; M. J. T. McNeil, Inspector, River Bourgeois, C. B: A. D. Brown, Bridgetown; Miss N. A. Burgoyne, Windsor; Jas. H. Munro, Inspector, Yarmouth.

History and Geography. J. B. Calkin, Truro; E. T. McKeen, Sydney Academy, Sydney; H. Condon, Inspector, Halifax; H. S. Freeman, Amherst; Miss I. M. Creighton, Halifax.

In consideration of the fact that the subjects of Music and Drawing are already under consideration by the Superintendent of Education, who can command the services of experts in these subjects, no sub-committee was formed to consider this part of the course especially.

During the summer vacation the chairmen of these several committees—in every case the first mentioned in the above lists—will meet to co-ordinate and harmonize the departmental revisions and to prepare a final report, to be submitted to the Association at its next meeting, which the Executive committee have decided shall take place in Halifax during the Christmas vacation instead of July.

It is very desirable that every teacher who feels an interest in the modification of any particular feature of the Course of Study should communicate with some member of the appropriate committee, while communications of a general character bearing the work of revision may be addressed to the Secretary of the general committee.

FRANK H. EATON,
Secretary of General Committee.

Truro, N. S.

For the REVIEW.]

The Board Schools of Huddersfield.

The opinion of good judges and the statistical tables place these fine schools among the very best in England for large average attendance and general efficiency. The buildings are very fine; and if ten square feet are allowed for each child as recommended, accommodation is afforded for 9,945 children. The number on the registers on the last day of the school year was 9,148. It is pleasant to record that practically all the children of school-going age are on the registers and the average of attendance is steadily increasing.

I must here gratefully acknowledge my obligation to Inspector S. B. Tait, whose skilful planning enabled me to see so much of these schools. The first department visited was the kindergarten, under Miss Tattersall, a pupil of Frœbel's widow. She was ably assisted by pupil teachers and monitors. The free-hand drawing on slates had just been completed by the upper class, some of whom had been attending for two or three years. The designs were well conceived and very neatly executed, and some would have been creditable to children twice their age. The marching plain and in figures was excellent in its freedom and precision. Singing by *note* was succeeded by calisthenic drill with wands; the value of this for moral training impressed me greatly, for no such large body of children who were ill-natured or inattentive could have gone through it without some of them being injured. Reading and writing are begun in the upper class of this kindergarten.

The collection of work done by the children was particularly good in card-board work, embroidery and perforating and basket-work in straw, paper and other fragile materials. The youngest was two years old and we were told that no child would be refused admission. Evidently this Huddersfield School Board understands its business and is prepared to do it. The reading and speaking was much better than in the schools of Hastings, where the vicious habit prevails of squeezing out the vowels like a down-east Yankee. A detailed account of all I saw would fill this number of the REVIEW, but I must refer to the sewing, darning and knitting in the different grades, which was beautiful. The first darning is done on canvas with two colors, red and blue, crossing each other. The next step is to darn a small piece of whole knitted underwear and cross it; then a worn piece—a little broken—is done; next a piece slit diagonally is darned and crossed. Thus this important means of repair is proceeded with systematically, so that a child of ten will do beautiful work. Patching is done; first, with plain, white cotton, and proceeds gradually until an intricate pattern of printed cotton is matched so carefully that the patch is almost invisible. Would not a little of this sort of work be useful in our schools? I was shown in one school, in the girls' department, a large press packed with night-dresses and other ladies' underwear, aprons, etc., and knitted socks and stockings. Among the latter were some of the finest knickerbocker stockings for gentlemen. The articles are sold at the bare cost of the material, which is supplied by the Board.

A very enjoyable visit was made to the cooking class, presided over by a lady who holds a first-class diploma from the National School of Cookery. Instead of drawing, the girls who have passed a certain standard have two weekly lessons in cooking, one being in the theory and the other in the practical work. There were over thirty present, half of them taking up the practical work. One was scouring her table, another cleaning knives and forks, another mixing and beating up a seed-cake, while one had baked, *to a turn*, a plate of buns, of which we were kindly invited to partake. The other lessons were hashed beef, done up tastily, and cup-cake. It was a cheering sight to one who loves his fellows to see these little girls, looking so neat and clean and happy, busily employed in learning the practice of an art which adds so much to human well-being. Three well-cooked, daintily served meals a day in the poor man's home will powerfully predispose to abstinence from intoxicating drinks. The room was filled with a large range and an excellent gas-stove. The children can buy and take home what they cook for the trifle which the materials cost. It is an incentive to diligence, as the girls are charmed with the idea of learning to cook. A pleasant and instructive day was wound up by seeing over 800 children go through calisthenic drill *without* wands to the notes of the piano, which was played in fine, crisp style, just suited to the exercises which were sometimes so delicate that they were soundless, and sometimes so energetic that it was a rush and whirr and whiz of sound that almost appalled you with the majesty of simultaneous motion. The drill of fingers, separately and together, and that of the wrist movement, was fine. The Director was at home in his work and was quiet and self restrained, using very few words and gestures. While the majority of the children in these schools are poor and some of them "*half-timers*," it was pleasing to find that the better classes are beginning to patronize them on account of their superior excellence. The marching out to their respective rooms, some upstairs to those opening off the large gallery from which we viewed the scene, and some to those on the ground floor, was a sight not to be forgotten, presenting, as it did, such perfect, joyous orderliness.

The walls of the gallery were hung with pictures, some taken from illustrated papers, together with drawings and water-colors; but notably with finely colored pictures of birds and their eggs with a printed description attached. This is the work of a gentleman who is a prime mover in the School Society of Natural History. This body has its rambles, lectures and curriculum and is doing much for all connected with it. Huddersfield has a fine school of art in addition to its technical and scientific schools, which prepare for London University, and are in connection with the Guild and City of London Institute for the advancement of technical education. In common with Leeds Art School and others, that of Huddersfield sends the best productions of its most promising pupils to Kensington. Recreative and instructive evening schools, so called, are filling the gap between the Board School and the Technical College. They are attended very regularly by young people who have left school; 73 per cent were between the ages of thirteen and sixteen, thus proving that they did not, as was feared, interfere with advanced education. At the exhibition of recreative evening school work, held in London last year, Huddersfield compared well with other parts of the country and received a number of certificates for the productions of its pupils. The value of all this to a manufacturing centre like Huddersfield may be imagined. Indeed, so comprehensive is the curriculum that nothing seems left out. C.

For the Review].

Canadian Club of Harvard University.

An event of considerable interest from an educational standpoint, is the formation of a Canadian Club in Harvard University. Some four or five years ago the total number of Canadians in all departments of the University did not exceed seven or eight, but it has steadily increased until now they number about thirty. Of these, five are officers, and the remainder, with but one or two exceptions, are either in the graduate department or in the special schools. This is a fact that speaks well for the undergraduate departments of Canadian colleges, showing they are able to provide all that young Canadians require in the line of undergraduate study, and that it is only for the more advanced and specialized, or for professional studies they leave Canada.

Of the twenty-four or twenty-five students, the great majority are from the Atlantic Provinces, which is of course caused by the fact that we have not the facilities for graduate or professional studies that the Upper Provinces have, and a large proportion of our young men must leave us for such studies. The fame of Harvard and of Boston as educational centres, and their geographical position all tend to attract Atlantic Province men from the more distant and less well-known Upper Canadian colleges.

There is not in this (it may be said in passing) any reason for an effort on the part of our Atlantic Province colleges to form at present special technical schools. They have still too much room for improvement in their Arts departments, and too much need for all their funds for this purpose, to devote energy and money to organizing departments which must be fully equipped and well endowed before they can be of real value.

The formation of the club is due to the efforts of the energetic new Assistant-Secretary, Mr. M. Chamberlain. Its objects are partly to afford assistance to Canadian students, partly to advance the interests of both university and young Canadians by making them mutually better acquainted, and partly to afford a means of social intercourse and the encouragement of a Canadian feeling among its members. The great majority of the latter are strongly Canadian in all of their sympathies, and expect to return to Canada to live and work.

The President is Mr. F. W. Nicholson, a graduate of Mount Allison, and the Secretary, Mr. A. W. Macrae, of St. John, a graduate of Dalhousie. *

For the Review.]

A Vulgarism.

Scene — MEETING OF A TEACHERS' INSTITUTE.

Inspector,—LADIES AND GENTLEMEN,— Will some one be so kind as to parse the very common form of expression used in the sentence. "Most everybody has heard of the United States."

Miss Sophronia Yankton,—'Most' is the superlative degree of the adjective 'many.' In this sentence the positive degree of the word would be quite sufficient if the object of the sentence were a country of less importance than the United States of America—a nation confessedly head and shoulders above all creation. The superlative 'most' is therefore used in order to signify that not only everybody has heard of that great country, but that everybody on this earth has hear of it again and again and again,—in short infinitely oftener than any other nation on the face of the globe. Therefore, most is an adjective in the superlative degree, qualifying the noun 'everybody.'

Mr. Jonathan Cornstalk,—I quite agree with my fair countrywoman that the word 'most' in this sentence is an adjective in the superlative degree as ordinarily used. But when used, as in the sentence, referring to an object superlative in itself, it is a superfluity if taken as qualifying the word 'everybody.' Here it is adjective used as a noun, and therefore the sentence should read: "Everybody has heard most of the United States," *i. e.*, more than of any other nation on this terraqueous globe.

Mr. K. Nuck,—The word 'most,' as used in the sentence, cannot be parsed. It is a mere vulgarism, being a slang abbreviation for 'almost.' The sentence is really intended to mean: "Almost everybody has heard of the United States." This abbreviation is a vulgarism in the true sense of the word, for its origin is low and its use unfortunately common, even among partially educated people, *e. g.*, "Most all of our readers have heard," etc. "Most all the snow has gone." "Most everybody is down with *la Grippe*." "Most all the dogs in the town were howling last night, and most everybody says this is a bad sign in a time of sickness," etc.

Inspector,—I quite agree with you, Mr. K. Nuck. It is quite time that public opinion should rebuke and expel this and many similar vulgarisms. Particular care in this respect should be exercised by our teachers in the public schools, for if our young people begin the reformation its effects will soon be perceptible in the newspapers and in ordinary conversation. A.

For the Review.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

Fourth Paper.

In our former lessons we have been dealing with the notes of the DOH chord. These occur oftener than any other notes of the scale; and further, we meet with this chord much more frequently than any other. (A chord in its simplest form consists of three notes, beginning with any note of the scale and taking the 1st, 3rd and 5th.) Further, these three notes, d m s, are the principal notes of the scale; the pillars of the scale and the other notes or more leading or dependent notes. When these notes are thoroughly learned the others will be got much more easily. For these reasons it is most important that this first step be well taught.

Second step. We now proceed to the second step, the notes of the next chord in importance, SOH, TE, RAY,—the 5th, the 7th and the 2nd notes of the scale. Two new notes of the scale appear, te and ray. We call the 7th note te, not si, because we have s, the first letter of soh, the sign for the 5th note of the scale and need a new letter t as the sign for the 7th note.

A teacher who has no help can get the relative pitch of these new notes, thus: Take a low sound for d, and sing d M s. Take the sound s and sing it *d* then *m s*: thus, d M s, *d m s*. Then sing these notes up and down to lah. When this can be
done easily sing the same sounds to d M s s t r^1 r^1
as shown at the side. Then from s go down an d^1
octave and sing s_1 t_1 r which is the same as   T E
s t r^1 only an octave lower.

Proceed thus to teach your class: Sing, taking   SOH
a low sound for d, the notes d M s M d to the
syllable lah, and get the class to name the notes.   ME
Ask the class to look out for a new note and
sing to lah or figures d M s M r d. Ask where   DOH
it lies in pitch. Between M and d. Sing
phrases such as

|d:M|s:M|d:–‖ |d:M|s:M|r:–‖ |d:r|M:d|r:‖
|d:s|M:d|M:–‖ |s_1:d|M:d|r: ‖ |s_1:d|M:d|s:–‖

to show that r has not the bold, strong, firm effect of d, nor the gentle, calm, soothing effect of M, nor the bright, clear, ringing effect of s, but that it is the rousing rag, more suggestive of the running, rumbling brook than the quiet, placid lake which M suggests. Sing a few phrases for the class to distinguish the r from the other notes. The class will sing r much easier, as a passing note descending from M to d than ascending from d to m. So at first give them the phrase M r d and later d r M. Next develop the expectant nature of te, wishing to go to d and its piercing effect, especially at a high pitch, in such phrases as these: d:M|d:d‖ |d:–|M:d|d:–‖ |d:–|M:d|t_1:–‖ |d:–|M:d|t_1:d‖ |d:–|M:s|t:–|d:–‖.

When the class feel these effects the teacher d_1
may get them to sing the notes of the chord   T E
from pattern. Take a note about F or G, as   r SOH
doh and sing d M s; then sing these notes to t_1 M E
lah; next point to left and sing s_1 t_1 r as   R A Y
shown at side. Try this at pitch F G and s_1 DOH
A. Next point these notes on the main t_1
column of the modulator and let the class s_1
sing. Next sing as pattern and point on the
modulator these notes to key F.

| s_1:t_1|r:M|r:d|t_1:d|M:s|M:r|d:t_1|d:–‖.

Note that the intervals s_1 t_1 r are the same as d M s. Exercise the class on these two chords, pointing the following on the modulator. Key C E and D.

| d:M|s:–|s:t|r^1:–|r^1:t|s:–|s:M|d:–‖.

For some time use these new notes t and r as passing notes, do not approach them by a leap.

Time Exercises. Beat down and up pulse and sing d to down pulse, d d of equal duration to down pulse. Are all these three notes same length? The first is sung as long as the second and third together. Get class to repeat this till they can do it with ease. The second and third d together will occupy then an equal space on the paper as the first d. If the second and third notes are the same length each half a beat we put a dot between and write thus: d: d.d‖. Sing M and S in same way. Next sing d, d: d M.M:M s.s:s‖.
taa tai taa.

The time names for two half beats are taa tai. Give the time names to the following:

			D. C.
s_1.d : d	s_1.d : d	s. M: s. M	d. d : d ‖
taa tai taa	taa tai taa	taa tai taa tai	taa tai taa ‖

D. C. means go back to the beginning. Sing this exercise all to d, then to M and next to s. Then sing first bar to d, second to M, third to s, fourth to d^1. Next sing the exercise as written.

The object is to present only one difficulty at a time; first master the difficulty of the time and then take also tune. Be careful that the pupils do not shorten the d a whole beat which they are apt to do. If this be done, or if otherwise there is difficulty in the time, the exercise may be treated at first as four-pulse measure, and beat down s_1, left d, right and up to next d. After it can be done easily and correctly beat two to each bar instead of four.

J. Anderson.

Musquodoboit Harbor, N. S.

In the Primary School.

The Noun.

T. Some words in your reading lesson are names of things or of persons—names of something. Now, find some of these name-words in your lessons?

S. "Ran."

T. Did you see a "ran?" Is "ran" a thing?

S. No. John ran.

T. Which word is the name-word?

S. John.

T. Is "ran" the name of anything?

S. No. John ran.

T. "Ran" tells what John was doing, does it not?

S. Yes, it is a doing-word—tells what John was doing.

T. Very good. Find some more name-words.

S. School. Flowers. Sky. Rabbit.

T. Day—is that a name-word?

S. Yes. There is yester-day, fine day, rainy day. Day is a name-word.

T. Well, let us try to get a shorter word for name-word. The Latin people who made our letters said *nomen* for name. And some people who couldn't spell nor pronounce properly—old French people—shortened it to *nom* and pronounced it something like *nong*. When old English people long ago heard this word they thought *noun* would be a pretty good way to spell it. And we must just take their old notion, because we are not allowed to change words now, and we call *name-word* for short, *noun*.

S. Noun, nong, nom, nomen. Were they not very great scholars when they changed the word so many times?

T. No. They changed them because they were such poor scholars.

S. And were very many words changed that way?

T. Yes. Nearly all our words. But we have schools to train people not to change words.

S. To change the spelling or the pronunciation of a word is a grammatical blunder then.

T. Correct. We must go by authority.

S. Is not that the same as saying to be grammatical we must copy exactly the grammatical blunders of the people before our time.

T. Well, yes. But we must do so, or else every person might be making changes to suit himself, so that in a very short time the English language might change in some places so that we could scarcely understand it.

S. Well, couldn't they make changes at headquarters—changed hard and long words to easy and shorter ones. We could write them twice as fast.

T. Well, probably they may when you are at headquarters; but there are no real headquarters at present. So let us see that we can all spell and pronounce n-o-u-n.

S. N-o-u-n.

T. This word is shorter and easier than name-word, is it not?

S. It is shorter.

T. Well make a list of all the nouns you can find in your lesson.

(They make a list).

T. Now, I am going to write them down in a column on the board, beginning at the first. (Teacher writes down first noun). All who have this show hands. Any who missed—hands.

T. Very good. Now for the next. (Teacher goes on until a column of nouns is on the board, and all the nouns missed by any of the pupils have been noticed. The column of nouns is left on the board for the next lesson when *adjectives* will be placed before them).

Hints to Primary Teachers.

A bright teacher in Malden employs a simple but effective means of promoting punctuality and attendance among the little ones. Her grade is the lowest primary. She buys two pieces of narrow ribbon of different colors. From these she makes a number of small knots of the separate colors, and a larger one of the two ribbons. When Friday afternoon comes the scholars who have been punctual and regular in attendance are each given a knot of ribbon to wear, the boys having one color and the girls the other, while the teacher wears the large one of the two colors.

At the close of the session ribbons are handed back to the teacher. Visit this room any Friday afternoon and the proud look of the wearer of each bit of ribbon tells you that the decoration of honor is one greatly desired. It is a simple devise, but an effective one.—*Common School Education.*

Why Some Teachers do not Succeed.

1. They do not give special attention to the details of the work and discipline. Before the opening hour and during the recess they pay no attention to the conduct of pupils on the play-ground. One quarrel on the play-ground will cause trouble for months. During the recess is no time for a teacher to put work on the board, sit down at the desk, read a newspaper, or write letters.

2. They take their places before the class with a face void of expression or interest, and with a slow, listless manner, and then wonder why their recitations are not as interesting as those of some other teacher.

3. They will go buggy riding until ten or eleven o'clock, or entertain "the special friend," and then complain next day that the "children were so mean." No wonder! Reflection!

4. They are not really interested in the advancement of the pupils in their classes (their interest is in the salary), and then are foolish enough to expect the pupils to be interested in the school work. They make no effort to get the pupils interested in their work, and then blame the superintendent, board, and parents for not supporting them for their position.

5. They pretend to be professional teachers, and still they never read an "educational paper" or a work on teaching. They are no better teachers this year than they were two years ago, and blame the board for sending off and selecting live teachers for their places.

6. They are not uniform in their discipline in the school; "it varies with the weather." They threaten, scold, and grumble, and call it "discipline." When they want order, they "clap their hands, or rap on the desk," or in some other way make more noise than the pupils are making, and thus attract their attention.

7. Having attended a normal school, they place their old "note books" on the desk and teach from them. They serve to their pupils the same dish this year that they did last year, without even putting in a little fresh seasoning by way of preparation during the preceding evening, and then wonder why the pupils do not relish the dish.

8. They believe that the text-books was printed to be committed, and they bend all their energies to secure that result in their work. They do not have the slightest idea that education is the development of mental power and not the accumulation of a list of facts or theories.

9. The work done this quarter is passed and then let severely alone. When the pupils are examined upon the preceding term they say, "We had that last term." In place of keeping the work well reviewed all the time, they have a special review, just before examination, and call it "keeping the work up."

10. They attempt to do too much, and thus do nothing thoroughly.—*Colorado School Journal.*

Why Some Teachers do Succeed.

1. They have a clear and definite idea of what they wish to teach. This requires a clear and distinct knowledge of the subject, or, in other words, of the entire group of ideas that constitute that part or phase of the subject which they are undertaking to teach. The order in which these ideas follow one another is also seen, and this constitutes the method of teaching.

2. They have a definite notion of what the pupil already knows, which they have discovered by conversation with the pupil and by questions. An inventory of the child's mental possessions has been taken, and the teacher has compared its knowledge with the subject, and knows what is the next thing to teach.

3. They have thought through the lesson before the recitation hour, and have chosen a way of approaching the main point that is to be impressed. They have thought of illustrations and of other matter that will add interest to the subject of the lesson.

4. But they use this preparation freely and as the state of mind of the class suggests. A preparation servilely followed will prevent the spontaneity that makes a recitation a success. They follow the inspiration of the moment, but the antecedent preparation gives a general direction to this inspiration.

5. They always connect the first part of the lesson

of to-day with what has gone before, and make the entire work of the month or term one connected whole.

6. They hold the class for a definite amount of preparation and test them thoroughly upon it.

7. They are genial and pleasant in their intercourse with the children but, exacting in the matter of work assigned and of duty. But they never allow any barriers to grow up between themselves and their pupils.

8. They do not talk about rules, but about what is right and for the best. They are indeed earnest in their efforts to help the children, and are alive to every suggestion and source of help within their reach.

9. They do not worry about what they cannot help. They do the present duty as well as they know how, and then do the next one cheerfully but earnestly and have faith. Worry kills more people than work.

10. They have learned to labor intelligently and to wait with patience. And, besides, they take good care of their health, and so are full of hope and courage, always looking up and not down, forward and not backward, and are ever ready to lend a hand. —*Public-School Journal.*

Le Monde, of Montreal, the greatest French daily in Canada, sharply castigates the Boston *Gazette*, which says:

> The French Canadians who predominate in the Province of Quebec, are making efforts to banish the English language from the schools and the procedure of the government of the province.

Says *Le Monde:*

> It is the contrary which is the truth. To-day, in the Province of Quebec, more than ever before, are effective efforts made to teach the English language in our schools . . . The French Canadians have no other object in view than that of working in frank and patriotic union with English, Scottish, Irish, German, and other Canadians for the greatness and prosperity of our common country.

BLOMIDON.

This is that black rock bastion, based in surge,
Pregnant with agate and with amethyst,
Whose foot the tides of storied Minas scourge,
Whose top austere withdraws into its mist.
This is that ancient cape of tears and storm,
Whose towering front inviolable frowns
O'er vales Evangeline and love keep warm—
Whose fame thy song, O tender singer, crowns
Yonder, across those reeling fields of foam,
Came the sad threat of the avenging ships.
What profit now to know if just the doom,
Though harsh! The streaming eyes, the praying lips,
The shadow of inextinguishable pain,
The poet's deathless music—these remain!

— *Charles G. D. Roberts in February Century.*

English Engineering.

If the President of the French Republic was justified in appealing in a recent speech to the Eiffel Tower as "a monument of audacity and science," what are we to say of the Forth Bridge? By Mr. Baker's kindness I am able to place in the position in the trophy, justified by the carbon it contains, a plate from the Forth Bridge which fell from a height of some 350 feet, and being of excellent quality doubled itself on the rocks below. A single span of the Forth Bridge is nearly as long as two Eiffel Towers turned horizontally and tied together in the middle, and the whole forms a complicated steel structure weighing 15,000 tons, erected without the possibility of any intermediate support, the lace-like fabric of the bridge soaring as high as the top of St. Paul's. The steel of which the compression members of this structure are composed contains twenty-three per cent of carbon and sixty-nine per cent of manganese. The parts subjected to extension do not contain more than nineteen per cent of carbon.—*Prof. Robertson-Austen, before the British Association.*

A new industry has sprung up lately which promises, says the *Scientific American*, profitable results. It is frog raising. A farm for this purpose at Menasha, Wis., is in full operation and stocked with 2,000 females, which are capable of producing from 600 to 1,000 eggs at a time. The owner of the farm gives some other interesting facts relative to the frog's habits which are not generally known. He says:

"In ninety-one days the eggs hatch. The thirty-ninth day the little animals begin to have motion. In a few days they assume the tadpole form. When ninety-two days old two small feet are seen beginning to sprout near the tail, and the head appears to be separate from the body. In five days after this they refuse all vegetable food. Soon thereafter the animal assumes a perfect form. Next spring 25,000, at 20 cents per dozen will be my reward. Figure it yourself," says the enthusiastic frog farmer, "and see if there is any money in batrachia, *alias* frogs."

The longest distance over which conversation by telephone is daily maintained, is 750 miles — from Portland, Me., to Buffalo, N. Y.

AN examination is not so much for the purpose of finding out what a pupil knows, as *ascertaining his mental power.* Technical knowledge goes for everything in a school graded according to the cast-iron plan of some critics; but it goes for much less in a school where each pupil is studied, as far as it is possible to do so, and treated according to his individual wants.

Selected for S. P. C. A. Column.]

For Teachers.

"It is not difficult to enlist the sympathies of children in the animal world. Take, for instance, the history and habits of birds; show how wonderfully they are created; how kind to their young; how useful to agriculture; what power they have in flight. The swallow that flies sixty miles an hour, or the frigate bird which, in the words of Audubon, 'flies with the velocity of a meteor,' and according to Michelet, 'can float at an elevation of ten thousand feet, and cross the tropical Atlantic ocean in a single night'; or those birds of beauty and of song, the oriole, the linnet, the lark, and, sweetest of all, the nightingale, whose voice caused one of old to exclaim: 'Lord, what music hast Thou provided for saints in heaven, when Thou hast afforded such music for men on earth?'

Or, take that wonderful beast of the desert, the camel, which, nourished by its own humps of fat, and carrying its own reservoirs of water, pursues its toilsome way across the pathless deserts for the comfort and convenience of man.

Is it not easy to carry up the mind and hearts of children by thoughts like these from the creature to the infinitely wise, good and powerful Creator?

'Ever after I introduced the teaching of kindness to animals into my school,' says M. De Sailly, an eminent French school-master, 'I found the children not only more kind to animals, but also more kind to each other.' 'I am sure children cannot be taught humanity to animals without at the same time being taught a higher humanity,' says the superintendent of the Boston public schools. 'The great need of our country,' says Hiram Powers to me at Florence, 'is more education of the heart.'"—*From "Protection of Animals" by Geo. T. Angell.*

PERSONAL.

William Lyall, professor of logic and psychology in Dalhousie University is dead, at the advanced age of 79 years. His fame in his department was a wide one, due principally to his book, entitled, "The Intellect, the Emotions and the Moral Nature," which took rank as a college classic.

Professor Charles MacDonald, of Dalhousie University, is electrifying the people of Halifax by his popular, powerful and peculiar way of expounding philosophical and scientific ideas and principles.

EDUCATIONAL OPINION.

Teachers, as a body, have innumerable problems of education to solve, and these problems are of vast importance both to the profession and to the community. To keep attention fixed to these problems, to help by articles to throw light upon them, to aid by hint, criticism, discussion, commentary, or otherwise in their solution, is the proper work of educational journals in the interest of progress and reform. —*The Teacher, N. Y.*

Professional teaching should be considered as important for a teacher as for a doctor or a lawyer. It is so considered in Ontario, New Brunswick, and all countries which stand high educationally. Of the teachers of this province only twenty per cent hold normal school diplomas. Halifax shows about twenty-five per cent. While a normal school training does not by any means imply a successful teacher, yet the advantage is very great. The excellent system in vogue with the sisters of charity, of the selection of the fittest and the continual elimination of the unfit, makes it almost impossible for a poor teacher to come from their ranks, yet even they would profit by an enlargement of their mental horizon, by having the science of teaching added to their practical skill and admirable discipline. * * * Many towns find it profitable to have special training-schools for their own teachers. It has occurred to me that for the benefit of those now settled in the profession in Halifax, such an institution might be started here, the various subjects in pedagogy being taught by such men as Prof. MacGregor, Prof. Seth, Principal MacKay and others. At all events I am firmly convinced that the time has come after which no person should be admitted into the teaching profession permanently without a substantial guarantee of professional knowledge and practical skill.—*Supervisor McKay, Halifax.*

In response to a circular issued in January, 1888, classes were formed for the study of the Tonic Sol-fa System. About seventy (70) teachers gained a knowledge of the system. Under the authority of the teachers' committee, arrangements were made by which those able to teach music exchanged work at stated intervals with those who were less fortunate in that respect. As a consequence there are now 5,515 pupils learning to read music in our schools. It will be satisfactory for you to be informed that the council of public instruction has endorsed the system and that Tonic Sol-fa is regularly taught in the provincial and model schools.—*Supervisor McKay, Halifax.*

* * * A great deal has been done in late years to bring up the standard of their profession. The *Globe* has always held that this could be best done by the teachers themselves, not by mere complaints, but by a steady line of assumption of the value of their services to the country, and that their natural conditions would improve as the people became aware, as they gradually would, how important and how beneficial is the work of education. Steadily the profession of school teaching has advanced in the estimation of the public, and if the advance has not been as rapid as some of the teachers would like, yet they must all admit that there is substantial progress, progress due in part to the better position taken by the teachers, consequent upon their own efficiency, which, in its turn, is due in a large degree to the increasing efficiency of the normal school. *St. John Globe.*

BOOK REVIEWS.

Easy Things to Draw. Especially designed to facilitate drawing on the blackboard. E. L. Kellogg & Co , publishers, New York and Chicago; price 30 cents. This little work contains a collection of drawings exceedingly simple, but presenting such an infinite and pleasing variety of forms that its use in the school-room for object-lessons and busy work would be of great advantage.

Angelic Chords; a collection of duets, trios and choruses for high schools and colleges. Publishers : J. Fischer & Bro., 7 Bible House, New York. This collection embraces twenty-four selections suitable for commencement and other occasions with words in English and German.

New York State Graded Examination Questions, with Answers. Cloth, 12mo , 220 pp. New York and Chicago: E. L. Kellogg & Co. $1.00. This is, in a collected form, the questions given out by the Department of Public Instruction, commencing September, 1887, and ending August, 1889, with the answers They contain many excellent questions in all branches, suitable for reviews and examinations.

Word by Word, an illustrated spelling book for showing the structure of English words and training the vocal organs to clear enunciation. By J H. Stickney, pp. 112., 12mo. ; $0.22. (Boston, U. S. A., Ginn & Co , 1890). This is a well arranged series of elementary lessons in reading and spelling, accompanied with models of script writing It might be introduced during the second year of the primary course with very good effect.

A Report in regard to the *Tone and Tendencies* of Harvard University, made by a committee of students from other colleges now studying at Harvard, pp. 32. (Geo H Ellis, 141 Franklin St , Boston, 1890). This was suggested, we presume, by some press criticisms on the great university The result, we think, must be that Harvard will be more favorably known to the world than ever before.

Manual of Empirical Psychology. As an inductive science, a text-book for high schools and colleges, by Dr. Gustav Adolf Lindner, Professor in the University of Prague. Authorized translation by Charles DeGarmo, Ph. D. (Halle), Professor of Modern Languages in Illinois State Normal University. 12mo , pp XIII. + 274. (Boston, D C. Heath & Co., 1889) Professor Lindner belongs to the Herbartian School, the members of which in Germany appear to lead in pedagogical thought. In this work the psychological system is based on the most rigid observation and not on assumed general axioms The inductive or truth-seeking method is attempted to be followed instead of the inductive or hypothesis constructing method Instead of making a bee line in space from an *a priori* starting point, he walks off with his hand upon the guide line of experience. The volume is not large and is well arranged. The style is clear and the thought is expressed without any unnecessary verbiage. It is well worth a place in the library of the teacher.

Schillers' Ballads, edited with introduction and notes by Henry Johnson, Ph. D , of Bowdoin College, Me. ; Sept Grands Auteurs du Dix-neuvième Siècle, by Alice Fortier, Tulane University of Louisiana. Publishers, D. C. Heath & Co , Boston. The above are convenient little volumes published in "Heath's Modern Language Series," the design of which is to furnish in a cheap and convenient form some of the best works of French and German authors, carefully edited and with judicious notes to aid the scholar.

RECEIVED.

Syntax of the Moods and Tenses of the Greek Verb, by W. W. Goodwin. Ginn & Co , Boston.

Æschines Against Ctesiphon, by Prof. R. B. Richardson, Dartmouth College. Publishers, Ginn & Co., Boston, Mass.

The Elements of Astronomy, by Prof Chas A. Young. Ginn & Co., publishers, Boston

Animal Physiology, by Prof Mills, of McGill University, from D. Appleton Company, publishers, New York.

Lamartine's Jeanne d'Arc; Alexis Piron's La Metromanie, a comedy in five acts. D. C. Heath & Co., publishers, Boston.

Arithmetic for Beginners London, MacMillan & Co., and New York.

PUBLICATIONS RECEIVED.

Vick's Floral Guide for 1890, published by Jas Vick, Seedsman, Rochester, N. Y., is a marvel of beauty in its illustrations of plants. Those who are beginning gardening cannot do better than turn their attention to its pages. ....*St. Nicholas*, for February, contains a historical sketch by Prof C. G. D. Roberts, of the United Empire Loyalists, the scene of which is laid in Sunbury County, N B.... *Century* for February contains instalments of the biographies of Lincoln and Joseph Jefferson...Prof. Fisher, in the third paper of his series on "The Nature and Method of Revelation," describes the differentiating of Christianity from Judaism, and devotes a good deal of space to the work of the Apostle Paul. Professor Fisher says that Paul "took a stand at Jerusalem like that which Luther took at Worms." He adds that "but for Paul there would have been no Luther"....The *Popular Science Monthly*, for February, has many valuable articles on scientific and educational subjects. An editorial on "Useful Ignorance" advises sparing sowing of educational seed, as there is no way of thinning out crowded intellectual growths....*Grip* began its thirty-fourth volume with the new year, which means that this brave little journal has celebrated its *seventeenth* birthday *Grip* has well deserved its success. It is not merely a clever and amusing paper, it is also a recognized power in Canadian public life, and a power which, we are glad to say, is always on the right side where questions of moral principle are concerned. It ought to be a pleasure to every Canadian to contribute to the success of such a journal,—and the most practical way of doing this is by subscribing. The price is only two dollars per year. Subscriptions may be sent direct to *Grip*, Toronto....The *Scientific American* publishes a special monthly edition in Spanish for the benefit for its readers in Central and South America—a further proof of the popularity of that journal....The N. Y. *Teacher* is an ably conducted journal, whose articles are excellent in tone and worth reading....The first February number of *Garden and Forest* contains an article on the Heath Plant, its whereabouts in North America.

LITERARY NOTES.

A neat little booklet printed by Messrs. J. & A. McMillan, St. John, during the holiday season, contained a few of the poems of Mr. H. L. Spencer (Enylla Allyne). But the friends of the poet missed many of their favorites from the collection, and they will be glad to know that a larger volume will shortly be published, under the poet's own supervision, containing all the sonnets and lyrics which he cares to have preserved.

"Plant Organization," by R. Halsted Ward, M D., F R H.S, Professor of Botany in the Rensselaer Polytechnic Institute, Troy, N Y., is shortly to be published by Ginn & Co, Boston. It is a guide to the study of plants It consists of a synoptical review of the general structure and morphology of plants, clearly drawn out according to biological principles, fully illustrated, and accompanied by a set of blanks for writing exercises by pupils. It also provides for some easy microscopical work, if desired Though requiring a very thorough study and exact understanding of the plants which may be selected for study, the work is so systematized and simplified as to be adapted to the use of beginners, in connection with personal instruction or with any text-book of botany however elementary, and either with or without the employment of technical botanical terms. The work, which is designed for private students or for classes in academies, seminaries, high schools, etc., is now issued in a second and revised edition after having proved its value.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N.S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m.

The course of study includes:

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Botany, 8 lectures—By Inspector Lay, Amherst; assisted by Principal Creighton, Compton Avenue School, Halifax.

Mineralogy, 8 lectures—By A. J. Pineo, A. M, Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.

Physics, 8 lectures—By Principal E McKay, New Glasgow.

Chemistry, 8 lectures—By Prof. A E. Coldwell, Acadia College, Wolfville; assisted by W. E Kennedy, Esq., Halifax Academy.

Physiology, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville.

Geology, 4 lectures—By Prof. Kennedy, Kings College, Windsor.

Astronomy, 4 lectures—By Principal Cameron, Yarmouth Academy.

Tonic Sol-fa—By Miss A. F. Ryan, St. Mary's School, Halifax.

Elocution—By Miss H. E. Wallace, Acadia Seminary, Wolfville.

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The attention of teachers and science students in the Maritime Provinces is invited to the professional and practical advantages of this Summer School.

For a calendar giving full particulars regarding text-books, their cost, apparatus, etc., recommendations from the lecturers, etc, address

A. H. MacKay,
Secretary Summer School of Science,
Halifax, N. S.

Halifax, 7th February, 1890.

McGILL UNIVERSITY,

MONTREAL.

The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 16th. 1889).
Donalda Special Course for Women—(Sept. 16th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
Faculty of Medicine—(Oct. 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

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Catarrh, Catarrhal Deafness, Hay Fever.

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Sufferers from catarrhal troubles should carefully read the above.

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G. U. HAY, Ph. B., Editor for New Brunswick.

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EDITORIAL NOTES.

WE have received many warm commendations from our subscribers on the valuable articles contained in the February REVIEW. Turning to that number we find the list of contributors is larger than usual, and the topics treated are of interest and value to all classes of educators. From month to month the REVIEW is becoming more and more appreciated by those who have their work at heart and who find its pages stimulating them to further and higher efforts. To continue this work, a work in which every community in these Atlantic provinces is interested, we ask for further additions to our contributors' column. We ask those to contribute who have something that will stimulate and encourage others—short helpful articles on methods that teachers have found to be successful in their classes; suggestive sketches on our history, geography, natural science; criticisms on systems and methods that are excellent or faulty; with items of personal interest.

A subscriber writes: "I find your astronomical articles so interesting that I can scarcely wait for the night to verify the statements in them."

PHILIP COX, A. B., Principal of the Newcastle, N. B., High School is contributing to the *Advocate* a series of valuable papers on the Winter Birds of the Miramichi. The articles so far as they have appeared give much useful information about the birds that winter with us, their habits, food, etc. Mr Cox is a pleasing writer as well as an industrious and enthusiastic naturalist, and when he puts on his snow-shoes for a tramp in the woods it is to some purpose.

We have to thank the editor of the *Dalhousie Gazette* for the excellent cut of the late Professor Lyall, LL. D., F. R. S. C., which appears in this issue.

THE National Education Association of the United States will meet this year in St. Paul, Minn., from July 8th to 11th.

IN this issue Messrs. McMillan advertise an excellent work for schools or private study—Meiklejohn's English Language; the Sessions of the Toronto Woman's Medical College are announced; D. C. Heath & Co. advertise school books; Jas. Vick, Seedsman, gives some information for gardeners; and the announcement of the Ingres-Coutellier School of Languages is made. This latter takes the place of the Berlitz School, but the teachers are the same. Spanish has been added to the list of languages. With accomplished and energetic teachers this school is rapidly extending its branches throughout New Brunswick and Nova Scotia.

DUAL LANGUAGE DEBATE.

This great debate will be historical. It gave an opportunity for speech-making. It disclosed an important view of public sentiment. But after all, in the historical future it must show even the radical reforming English representative to be rather an absurd sort of a reformer after all. Evolution is slow. If the delicious morsel of sucking pig was accidentally roasted by the burning down of the primitive hut, it was only quite natural that more huts should be built and burnt down purposely over the gastronomic piggies. It probably required some time to discover a more economical method of making a roasting fire.

> Science moves, but slowly, slowly; creeping on from point
> to point.

A conspicuous Imperial Federationist, *mirabile dictu*, appeared to take as an axiom. "No community of language no unity of Dominion." It transpired that in the great Imperial British empire but a small minority spoke the English tongue, perhaps about one-fifth. The brilliancy of this ultra-English champion will scarcely eclipse the splendid pose of British muscle seen reclining in the editorial chair of a London thunderer who damned most contemptuously the notion that a few extra letters would handicap the growth of the great English language. Several nations have already reformed their orthography, restored spelling to its original function, consigned the ignorance and conceits of more vain than learned and sensible ancients to the limbo of historical dictionaries, brushed the barnacles from the bottom of the ship, and now make several knots more per hour in the race. A tar on the "Great Eastern" might smile at the impotence of a barnacle, but what would the officers think of a huge bottom-load of them? But the slow brain is yet on the quarter-deck. The momentum of the huge mass is relied on to press its way through the waves. But millions of foot-tons of the Antæan energy of the boilers are utilized in tearing the water into myriad ribbons of foam to the immense delight of the little fishes beyond, although to the deep chagrin of the intelligent engineer within. Germany, with but comparatively little to reform and little to gain, a few years ago by Imperial decree reformed the spelling in the equivalent of our common schools, and it was directed that five years later the change would be compulsory in the high schools. Already the great mass of German literature is appearing in the new orthography. France is just now commencing to be agitated with the same problem, although its spelling is incomparably more simple and regular than the English. And although the discussion is but a few months old, we observe it has already moved some of our Canadian French exchanges to discussion.

If our English reformer would endeavor to advance the interest of the English language, it should be by moving for a simplification of a mischievous spelling condemned now by every leading philologist in England and America—a spelling which makes it extremely difficult for the French or any foreigner to acquire the language. At the present time, more than ever before, we have good reason to believe, the French of Quebec and of all our provinces are making strong attempts to learn English. But we have made a law to prohibit their acquiring it, which is a hundred times more effective than any parliamentary statute against the use of French could be—we have made such a law in our system of spelling. And we ourselves pay a tax to support this law, more vastly horrible than the tax of the fabled minotaur of Crete on ancient Greece — the sacrifice of two years of the school life of every son and daughter in the vast English empire.

N. S. BARRISTER'S SOCIETY EXAMINATIONS.

Under a rule of the council of the barrister's society, the preliminary law examinations are held twice a year instead of once as formerly. The first winter examination under the new rule was held a few days ago, the result of the same being as follows:

H. E. Congdon, Berwick; H. B. Stairs, Halifax; D. A. Cameron, Sidney, C. B.

The names of the above candidates are given in the order of merit.

Five papers are required to be "passed" in the preliminary examinations above referred to, namely; 1, Latin; 2, Greek or French or German; 3, Mathematics; 4, English; 5, History and Geography. In each of these subjects, we understand, the syllabus will be approximately that prescribed from year to year by the Council of Public Instruction for the High School or Academic curriculum. Such an arrangement would give the best possible chance to all future law candidates whether attending the public schools or studying privately, and would be a great saving of energy in schools where students are preparing for various examinations. It has always been noticed as a strange anomaly that the *law* society should have so long ignored the *lawful* public educational curriculum. But, after all, evolutionary slowness is surer and safer than revolutionary rashness.

Course of Plant Study.

SQUEERS.—"Where's the second boy?"

SMALL BOY.—"Please, sir, he's weeding the garden."

SQUEERS.—"To be sure, so he is. B-o-t, bot, t-i-n, tin, bottin n-e-y, ney, bottinney, noun substantive, a knowledge of plants. When he has learned that bottinney means a knowledge of plants, he goes and knows 'em. That's our system, Nickleby; what do you think of it?"

NICKLEBY.—"It's a very useful one, at any rate."—"*Mr. Squeers's Educational System*" *in Nicholas Nickleby.*

It must be confessed at the outset that no direct application can be made of the above. Mr. Squeers is too radically phonetic as a speller to hold him up as an example. And although he cites a maxim that all practical educators will hail with delight—"he goes and knows 'em"—there is a strong suspicion left by Nickleby's answer that Mr. Squeers, who owns the garden, has a selfish end in view.

But Mr. Squeers certainly had a definite plan, and that is something. Nothing—or next to nothing—can be accomplished by giving a few object lessons on plants without any more definite end in view than merely to satisfy the requirements of the school curriculum.

It is time now to arrange your plan of work for classes in plant study. If your plan of work is carefully arranged and faithfully carried out, the interest will be great and increasing, and the value of plant study as a mental discipline for your classes will be unquestionable.

HOW TO PROCEED.

Turn up your fyles of the REVIEW for the spring of '88 and '89 and read what is there given about planting seeds in boxes so that plants may be ready for study in classes a few weeks hence. Make a list of plants in the neighborhood that flower early, such as the willow, alder, red maple and others, and though these are too difficult for younger pupils, a glance at their simpler characters, with notes on their time of flowering, drawing their parts, will pave the way for closer and fuller study next year.

BUDS.

This subject can well be taken up in March. (See "Leaves and Flowers in their Winter Homes," March REVIEW, 1889.) A talk on buds, showing that the miniature leaves and flowers they contain were formed last year and are securely folded up and protected during the winter, cannot fail to arouse an interest in nature and her plans.

For this and one or two succeeding lessons a few twigs will furnish abundant illustrations for the arrangements of buds.

Buds that grow at the end of stems and branches are called *Terminal.* The buds that grow on the sides are called *Lateral.* Lateral buds usually grow in the axils of leaves; they are then called *Axillary.* These buds are formed during the summer, and may usually be seen long before the leaves fall. Each leaf, as it falls, leaves a little scar where it grew. These scars may be seen just below the buds.

Buds are differently arranged on different species of plants. Look at the Lilac or the Maple, and you will see on each joint of the stem two buds, standing just opposite each other. This is called the *Opposite* arrangement. Each pair seems to be turned just half way round the stem from the pair below it. In the Cherry, Currant, Apple, etc., only one bud is found on each joint of the stem; and each bud is turned partly around the stem from the one next below it, so that no but is borne on the same side of the stem as the one next above or next below it. This we call the *Alternate* arrangement. It is also called the *Spiral* arrangement; for if a string be wound spirally around the stem, it will touch each bud. These buds are arranged according to fixed laws, which are very mysterious and interesting. The arrangement is always the same in the same species of plants. If there seems to be any variation, it is only because some of the buds have failed to grow. Sometimes we find each bud just half-way round the stem from the one below it, so that the third bud stands over the first. In other cases we find each bud just one-third of the way around the stem from the one below it, so that the fourth bud stands exactly over the first. Again, we find each bud two-fifths around the stem from the one below it. In this case we have to take two turns around the stem to find a bud that is exactly over the one from which we started. The first is called the half, or *Two-Ranked,* arrangement; the second, the one-third, or *Three-Ranked;* the third the two-fifth, or *Five-Ranked,* and so on. These different modes of arrangement may be expressed by the following fractions; $\frac{1}{2}$, $\frac{1}{3}$, 2-5, $\frac{3}{8}$, 5-13, 8-21, 13-34, etc., each fraction being formed by taking for its numerator the sum of the two preceding numerators, and for its denominator the sum of the two preceding denominators. The numerator of each fraction shows the number of turns we have to make around the stem to find a bud exactly over the one from which we started, and the denominator shows how many buds are found in the cycle No other arrangements than those indicated by fractions formed in this way, are ever found.

Sometimes three or more buds are found in the axil of a leaf. In most cases the middle one is a *leaf-bud,* while the others are *flower-buds.* These additional buds are called *Supernumerary,* or *Accessory.* In the butternut and in some other trees, two or three buds are often found one above another. The upper one is usually the strongest, and the only one that grows; but if it be destroyed, one of the others takes its place. Some buds remain alive year after year without growing. These are called *Latent* buds. When the top of the tree has been broken off, or in any way destroyed, these latent buds grow, to supply the deficiency. Some kinds of trees, such as the Beech, Willow and Poplar, form buds and send forth shoots wherever they are bruised or cut. Such buds are called *Adventitious.* Adventitious buds sometimes grow even on roots, which do not usually produce buds. In cold climates, buds that are to survive the winter are covered with scales to protect them from sudden changes of temperature. These are called *Scaly* buds. The buds of herbs, and of trees in warm climates, have no scales, and are called *Naked.* In some species, the terminal buds are much stronger than the lateral; and then the tree forms a tall, spire-shaped top, as in the Hickory, Spruce and Poplar. In others the lateral buds are stronger; and the tree forms a broad, spreading top, with delicate sprays, as in the Elm and the Willow.

Astronomical Notes.

THE STAR OF BETHLEHEM.

Since writing the note on this subject for the February REVIEW, I have seen the prediction of the star's appearance in so many papers and have been asked so many questions about it that it seems worth while to give it a little more attention.

The following is the paragraph which has been going the rounds of the newspapers:

> "The Star of Bethlehem is again to be visible in this year, being its seventh appearance since the birth of Christ. It comes once in 315 years and is of wondrous brilliancy for the space of three weeks, then it wanes and disappears after seventeen months It will be a sixth star added to the five fixed stars in the constellation Cassiopeia while it remains in sight."

To the general reader this looks like one of those genuine astronomical predictions which are accepted now-a-days as matters of course. The reader who keeps himself posted on astronomical matters knows that this prediction is not genuine, that astronomy is not responsible for it, that it is just as true and just as credible as if it had been made about the ghost of Julius Caesar instead of the Star of Bethlehem.

There are no grounds, so far as I know, for predicting the appearance of Cæsar's ghost this year. If we knew that the ghost appeared in the year before 1 A.D., and if we knew it had appeared once every 315 years since, then we might reasonably expect its appearance this year; but even then there would be more of presumption than of prudence in asserting positively that it would appear.

And *if* we knew that the Star of Bethlehem had appeared in the year before 1 A.D., and *if* we knew that it had appeared again in the years 315, 630, 945, 1260, 1575,—then *et cetera* as before.

The truth of each of these things is asserted or implied in the paragraph quoted, but not one of them is known to be true. There is not a shred of evidence of any sort that this star was seen in any of the last mentioned years. (I'll take this back, and do it with pleasure, when the shred is produced.) And it is very far from certain that its first and only recorded appearance happened in the first mentioned year. (This is not theological heterodoxy, it is chronological orthodoxy.)

There is therefore not a whit more reason for expecting the appearance of the Star of Bethlehem this year than there is for expecting the appearance of Cæsar's ghost.

"It will be a sixth star added to the five fixed stars in Cassiopeia," says the prediction.

If Matthew's account of our star is true (and it is the only account we have), it was not a fixed star and it was not in Cassiopeia. No star in Cassiopeia could have been seen by the Magi while travelling from Jerusalem to Bethlehem, unless they travelled back foremost; and no fixed star could have behaved as it is said to have done during that journey.

That there are only five fixed stars in Cassiopeia will be strange news to all who know that constellation. Long before telescopes were known more than fifty had been counted in it. If the paragraphist had said five hundred thousand instead of five he would have been nearer the truth. If he had got nearer the truth on this point he might have done so also on other points, and then he might perhaps have left his paragraph unwritten.

What is written above contains the answers to a miscellaneous lot of questions received. What is written below is in answer to the question, "What is known or supposed about the Star of Bethlehem?" and "How do you account for the predictions of its appearance that we have been having lately?"

What is known about the star may be found in the second chapter of Matthew. For what has been *supposed* about it, the reader may consult whatever commentaries or Bible dictionaries or other literature of that sort that he can lay his hands on. And when he has done so, if his experience is like mine, he will find himself thinking of what Seth Bede's mother said about people making "a peck o' their own words out o' a pint o' the Bible's." He will probably find, as I did, that Origen and Chrysostom and sundry others thought the star was an angel: that another authority thought it was the Holy Ghost; that some thought it was a comet; and some that it was a "temporary" star (of which more anon). He may also chance upon a commentator who, after citing other people's notions upon the subject, proceeds in this way: "But I reply that it was a new and unknown star, entirely different from other stars, and superior to them in nine prerogatives." Then follows a list of the nine "prerogatives," one of which is that "the angels framed it of condensed air and infused brightness into it. And then we are told what the star meant (1) allegorically, (2) tropologically, (3) anagogically, and (4) lastly. I forgot to say that after telling us about what some others have to say, this commentator adds, "But such things, says St. Anselm, are fables and trifles."

It is not so easy to find out what astronomers think of the star. You might spend weeks in turning over astronomical books and find never a word about it. Perhaps this is because astronomers are not so much given to writing about matters that they know nothing of. I think it is very likely that if you were to ask any eminent living astronomer for information about the Star of Bethlehem, he would refer you to the second chapter of Matthew, and tell you it contained all he knew about the matter.

But there have been some astronomers—and eminent ones too— who have done some supposing and some figuring about it, among them Kepler, at the beginning of the seventeenth century, and Ideler and Encke in the first half of the present one. Their supposition was that the phenomenon which drew the Magi to Judæa might have been a conjunction of two of the larger planets, a conjunction so close perhaps that the two may have looked like one star. They figured their way backward through the centuries and found (I give Encke's results, the latest and most accurate) that Jupiter and Saturn were in conjunction in the year 7 B.C., that at the time of conjunction they were about a degree apart, and that three such conjunctions happened in that year,—on May 29, on September 30, and on December 5.

Is a distance of a degree small enough to make two bright stars look like one? Proctor thought it was—if the observers were "miraculously short-sighted." You can settle this matter for yourselves. The stars in Orion's Belt are about a degree and a half apart. On March 28, and again on May 30, this year, Saturn and Regulus will be about a degree and a third apart. You can easily imagine the former distance reduced by a third and the latter by a fourth. Do so, and then try to imagine a pair of eyes—not "miraculously short-sighted"—that could make the two objects look like one. [On the 13th of November next at 7 p.m., sixty degree time, Jupiter and Mars will be exactly a degree apart.]

This is one difficulty connected with the Jupiter-Saturn theory of the Star of Bethlehem. Another is as to the chronology. These conjunctions happened in 7 B.C. Was that the date of the events in Matt. ii. 1–10? And a third difficulty is to explain how these planets could be got to behave as the star behaved according to verse 9, and the natural inference from verse 10.

Now let us look back to the "temporary" star theory. In itself it is quite as reasonable at least as any of the other theories, but it is to it we owe all the nonsense that was talked and written about the Star of Bethlehem three years ago, which mess of nonsense we seem to be again threatened with this year.

A temporary star is an extraordinary star which appears for a time only. Eleven such are recorded in history—six between 150 B.C. and 1700 A.D., the other five within the last forty-two years. The most famous of the lot was the one of 1572, observed by Tycho Brahe. Any astronomy book will tell you about it—how bright it was when first seen, how for a time it grew still brighter and was visible in daylight, how within a week or two it began to fade but continued visible to the naked eye for sixteen or seventeen months, after which time it was seen no more. It appeared in Cassiopeia and was a fixed star while it lasted. This was an extraordinary star; the Star of Bethlehem was an extraordinary star; therefore, so said the fool in his heart, the two stars were ——, but we have not yet got all the facts. In 1264 and 945 brilliant stars appeared in the region between Cassiopeia and Cephus. We don't know that these appeared in the same spot as Tycho's star, but neither do we know that they did not. "We may suspect," says Herschel, all three "to be one and the same star with a period of 312 or perhaps 156 years."

There are known facts as to brilliant temporary stars in or near Cassiopeia, and that is what Sir John Herschel deduces from the facts —a "may suspect" and a "perhaps." But the Star of Bethlehem crank gets much more than that out of them. 'May's' and 'perhaps's' he cannot away with. Herschel may suspect that the stars of 945, 1264 and 1572 were one and the same star; this chap is sure of it and knows also that these three were one and the same star with the Star of Bethlehem. He may have heard that Beza, who was living in 1572 and saw Tycho's star, thought it was the Star of Bethlehem, just as some earlier theologians thought the Star of Bethlehem was an angel.

Now, given a fellow fool enough to believe that the identity of all four stars was established by the evidence adduced above, it is easy to see how he might have proceeded to evolve his prediction of its re-appearance in 1887 or 1890. Put the nativity three years before the Christian era, (when or about when it is now generally held to have happened), and the interval between the appearance of the star to the Magi and its appearance to Tycho is 1575 years. But it appeared in the 13th and in the 10th centuries as well as in the 16th and the 0th, therefore, it must also have appeared in the 7th and the 4th centuries. This makes six appearances in 1575 years, giving an interval of 315 years between each two. (The actual intervals between the recorded appearance of the real stars of 945, 1264 and 1572 are not 315 years; but when you put your hand to the plough of folly you must not look back for trifles like this). 1572 plus 315 gives 1887; therefore, the seventh appearance should have happened in that year. But it didn't; it was Venus that all those good people stood staring at with open mouths in those December mornings. Well, let us do some more tinkering at the facts. We'll keep the 315 years because it will save us the trouble of doing another division sum, and simply shift the date of the nativity three years forward to the beginning of the Christian era, where Denis the Little fixed it and where, of course, it ought to be. This, of course, shifts the date of each appearance of the star three years forward, and changes the 1572 with which we began operations into 1575. But that is only another trifle, and just see what we have gained by it. It makes the seventh appearance fall in 1890.

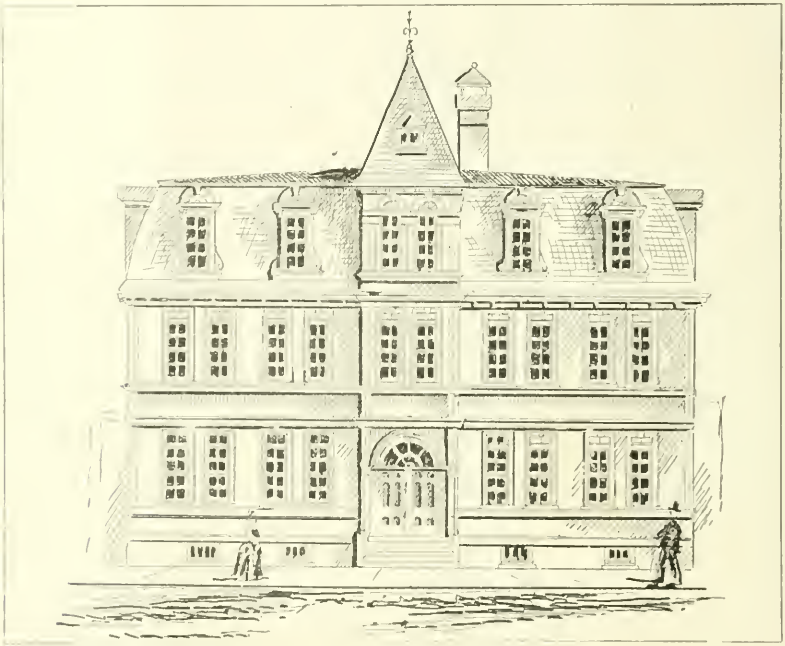
A. CAMERON.

Yarmouth, N. S.

The New Truro Academy.

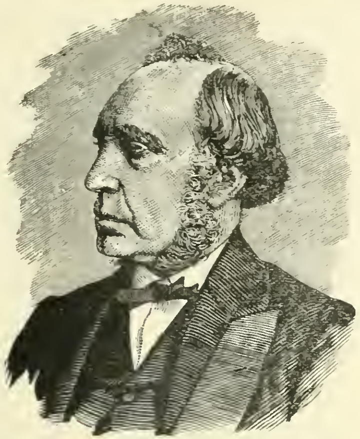
The new Academy is situated on the corner of Forrester and Victoria Streets, Truro, It is 67x50 feet with three storeys and basement, and is fitted up with all modern improvements. The building contains four large class rooms, each capable of seating sixty pupils, four cloak rooms for pupils, a laboratory, library room for teachers, museum, principal's office, and a large and comfortable Assembly Hall. The classrooms are large, well lighted and well ventilated, features too often found wanting in school rooms. Through the middle of the building run two large halls, on each side of which are the class rooms. Adjoining the class room on the right is the laboratory which opens before the class with double rising doors. A table on rollers brings before the class any experiments previously prepared. Provisions are also made by which pupils who wish can carry on special lines of work in chemistry. Immediately across the hall is the principal's office. On the same floor are two hat and coat rooms for boys. On the second floor are two class rooms similar to those on the first, museum room, a library room for teachers, and two cloak rooms for ladies. These cloak rooms will be supplied with water, for the use of the pupils. On the third floor is the assembly hall which will seat at least 400 persons. This will be the regular convocation hall on all occasions in which the whole school is assembled. The principal's class room is connected with the other rooms by a system of electric bells which will be used as a signal, summoning, dismissing and changing classes. In the basment are two hot air furnaces by which the building is heated.

The system of ventilation is the best we have ever seen. Under each floor are foul air shafts leading to the flues and connected with the room by registers in the floor. Fresh air is supplied by another shaft under the floor as well as transoms above the windows, thus giving the building a perfect system of ventilation. The ceilings are all done in panneling, and oiled and varnished. The sheathing, windows, doors, etc., are all finished in natural wood and oiled and varnished in the same way.



The building throughout presents a most handsome and pleasing appearance, and has an air of cheerfulness aboat it so often wanting in the ordinary school room. Competent judges pronounce the class rooms superior to anything else in the province.—*Col. Sun.*

[We might notice in connection with the above institution that the teaching staff is one of the strongest in the province. W. R. Campbell, B. A., is principal and master of classics and science. H. Putman, B. A., is master of English and history. Jas. Little is master of mathematics. May W. Griffin is teacher of music and elocution, Prof. Ornano of the Berlitz school of languages, has charge of the classes in French.]



Rev. Professor Wm. Lyall, LL.D., F.R.S.C.

Dr. Lyall, professor of logic and psychology in Dalhousie University, Halifax, died on the seventeenth of January, in his seventy-ninth year. He attended to his lectures as usual, until stricken with paralysis three days before his death. His life was that of the student. As metaphysician, he was inclined to the Scottish school, and was a special favourite of his distinguished teacher, Thomas Brown. He was not a technical theologian, rather an amateur, more learned than popular, and reflecting somewhat the light of Coleridge's religious philosophy. His style has been described by a writer in the *Presbyterian Witness* as follows: "His sentences and périods were faultless and beautifully balanced. His voice was soft, clear and low, and full of pathos. His action was graceful in a high degree. His face glowed with emotion and with a light that was not wholly of this world."

He was born in Paisley, Scotland, 11th June, 1811, and educated at Paisley Academy, Glasgow College, and Edinburgh University, and became minister of Uphall, Linlithgow, where he published a volume of sermons. In 1848 he was appointed to Knox College, Toronto, and 1850 to the professorship of classics and mental philosophy in the Free Church College, Halifax. In 1860 he was appointed to the same position in the United College at Truro. In 1863 he became Professor of logic and psychology in Dalhousie. He contributed a number of papers on theological and philosophical subjects to Canadian and foreign reviews. His chief work was the volume entitled, "Intellect, the Emotions, and the Moral Nature," published in 1855. This received high praise from the reviews, and was prescribed as a text book in several colleges. His fame as a philosophical writer secured for him in 1864, the distinction of the degree of LL.D. from McGill University, Montreal. And later when the Royal Society of Canada was founded, he was selected as one of the original Fellows, in section of English literature.

For the REVIEW.]

School Rooms.

We often think the children do not care whether their school-room is bright and pleasant or not. A year ago Amherst erected two new school-rooms, one of which was occupied by Grade II. The rooms were well painted, well lighted, had good walls, which were decorated by the teachers, and are very cheerful and bright. When grading time came one of the boys told his father he did not wish to grade and go over into the dull room occupied by Grade III. The remark is suggestive. Very few teachers understand how their pupils are being influenced. It has been a matter of experience, that if you fix up the school-rooms and corridors for the children they are careful not to deface them; but take no pains with the rooms and there seems to be no limit to their ability to disfigure.

AMHERST.

For the REVIEW.]

Our English.*

This is a small and interesting book on how to make teaching in English of greater use. The present state of things is bad; of that the author is convinced, as well as are other people. Children spell badly, and express themselves badly; when they cease to be children they do the same. Yet as Professor Hill says of his own college: Though "Harvard sends out men—some of them high scholars—whose manuscripts would disgrace a boy of twelve, the college can hardly be blamed, for she cannot be expected to conduct an infant school for adults." Then even when young persons at one age or other do get taught, pedantry comes across the path, and the last state of the man she meets is worse than his first.

As to the study of literature in this mother tongue, there is, our author says, *a* school where "the study of authors is made so interesting, that pupils who are preparing for colleges which have no examination in English are in the habit of joining the class in this subject for their own pleasure." Alas! he adds—"an anomaly, I believe, in the annals of American institutions of learning." Is there a summer school there for teachers and professors?

The admirably anomalous institution is perhaps where the happy spirit of the late Mr. Hudson lingers; in teaching Shakespeare, that well known Shakespeare editor had some such delightful experience as he tells in his *Essays on Education, English Studies, and Shakespeare.* For simplicity and common sense, and ways of saying things as an ordinary common-place person would say them, that little book was a worthy predecessor of *Our English.* The publisher was Ginn of Boston, in 1884.

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* OUR ENGLISH; by Prof. A. S. Hill. New York. Harper, 1889.

Neither Mr. Hudson nor Mr. Hill has rules for producing perfection in teachers or in taught; and neither thinks, on the other hand, that nothing can be done.

The author of *Our English* does nothing more than ask us to confess how bad things are, while he offers suggestions as to how each one must, in his writing, bind license down to liberty, and pedantry down to order.

To begin with,—it is obvious that, as Emmerson says, your child may be caught some births too late to make a scholar of him: we may have equal rights, but we are not equal. But "even she whose talk is the life of the school at recess, writes as if she were on her good behavior at a funeral. Even he who takes the lead among his fellows, in everything that requires quickness of wit, becomes insufferably dreary the instant he puts pen to paper." Taking the ordinary intelligence which might write fairly, the fact that teaching should lead it to dull mediocrity is the worst thing of all. Better have crowds of mistakes. But can these, too, be avoided, by teaching from the first the chief rules as to sentences and punctuation, not wearying with niceties; and by teaching spelling of all common words? Above all, our author says, do not waste time on grammar. Might not one reflect in this connection, that English speaking people in Europe do not speak and write worse than such in America, though they may be said to learn no grammar? As to punctuation, we should add, pierce unmercifully with full stops all ordinary young writers.

Together with this elementary teaching in correctness—no child's play—the child, and then the boy or or girl, must be given something interesting to write about, something that interests him or her. Let the writers sometimes or often choose their own subjects, we say.

If the writer abuses the freedom, the teacher no doubt can help by showing that liberty meant to the writer license. But can he do very much? Even if the writer is not caught too late, one has to ask: Is he bumptious and never in the state of one looking to be taught? Is he humorous in the bad sense, funny, in fact, and therefore vulgar? How has he spoken? How do his associates speak? Not everything rests with the teacher, even when the teacher is perfect.

But if license and "humor" are dangers in the path, so are pedantry, and what Professor Hill says he "must be pardoned for calling 'schoolmasters' English'—the dialect of men and women whose business keeps them in close relations with young minds, and who, being to a great extent cut off from intercourse with the world outside of the school room, are apt to attribute undue importance to petty matters, to insist upon rules, in cases where the best usage leaves freedom of choice, to prefer bookish and pompous ways of putting things to easy and natural ones."

He goes on to quote a poet, who, inspired by our author's words, wrote as follows:—

IMMODESTY.

I am a modest little maid,
Who thinks it more polite
To bid a man "good evening,"
Than bid a man "good night."
And when the human members
Are spoken of by him,
I always call what doctors call
"A leg" "a lower limb."

I am a modest little maid,
Who never goes to bed;
But to my chamber I "retire"
Most properly instead.
And when the chaste Aurora
Unseals my sleepy eyes,
The act which some call "getting up"
I designate "to rise."

I never speak of feeling "sick,"
But always say I'm "ill."
And being in my dressing-gown,
I style "*en deshabille.*"
In fact I always hesitate
To call a spade a spade,
Because, you see, I try to be
A modest little maid.

Coleridge had a master: "*Lute, harp* and *lyre, muse,* etc., were all an abomination to him..... 'Harp? harp? lyre? Pen and ink, boy, you mean! Muse, boy, muse? Your nurse's daughter, you mean! Pierian spring? Oh ay! the cloister pump, I suppose." But the truly great have all one mind, as the same Coleridge says; and so all sensible people, humorous in the good sense, agree about this. Another of them says: "Think as wise men do: speak as common people do." And even: "Be profound with simple terms, not with obscure terms."

What the author says about the younger pupils, he says about the older. That his own pupils may sometimes write in a heat, having no time for fine language, he gives essays to be written in twenty minutes, which plan Professor Hill finds to work well.

And then when it comes to study of literature, perhaps if we have aimed teaching chiefly at reality and simplicity, this study may become of more use than often it seems to be now. The two lessons to be learnt, are they not frank confessions of what one likes or does not like, *plus* suspension of judgment, and submission to opinions, even if you make no pretence to adopt them. Liberty and order, in fact, again: this everlasting problem. But liberty first, if possible. Do not suppress or even touch with the lightest finger of reproof particular signs of individuality—a sign, for instance, so good as the confession in the middle of an essay that the preceding part had been conventional repetition of opinions in which the writer did not believe. That should soften the severest confessor.

Mr. Hill divides his book into five parts—of which the first three seem the best—English in Schools; English in Colleges; English in Newspapers and novels; English in the Pulpit; Colloquial English.

Cannot even writers of books on English force the printers of the new world to say *wo-men*, not *wom-en*, and *know-ledge*, not *knowl-edge?* In these meaningless forms, the printers may *knowl* themselves to be right, but the writers must know them to be wrong, as do *know* the suffering readers, men and wo-men.

W. F. STOCKLEY.

Fredericton, N. B.

For the REVIEW].

English Literature in the School.

An interesting experiment in teaching English literature, which might be suggestive to some readers of the REVIEW, was recently made in the English department of the New Glasgow High School, under the care of Miss Nettie Forbes, B.A. On Longfellow's birthday, which REVIEW readers will remember falls on the 27th of February, lessons were thrown aside in the classes of each year and a "Longfellow celebration" was held. A few numbers selected from the programme carried out in the junior class will best explain what that meant. Thus, among the papers read were a "Sketch of Longfellow's Life" and a "Sketch of Evangeline." Then interspersed with these were quotations given by the pupils, the initial letters of which would spell "Henry Wadsworth Longfellow;" readings and recitations, the poet's "First Poem," "Last Poem," "The Abbot's Soliloquy," "The Clock on the Stairs," and about the middle of the hour a song and chorus—"Excelsior." Somewhat similar programmes were carried out in each of the other years. On the blackboards surrounding the room one pupil had drawn a sketch of Longfellow's residence in Cambridge, and others had printed appropriate mottoes in colored chalk. The "celebration" was a great success. The students took up the idea with enthusiasm, and it is safe to add that they carried away a deeper appreciation of Longfellow from this little break in the routine of class-work than they would have acquired by hours spent in monotonous recitation.

NEW GLASGOW.

Selected by Ladies' Auxiliary Committee S. P. C. A.]

Guardian Birds.

The RED-BEAKED OX-BITER (Rhinoceros Bird)

If we go into the African jungle we come upon an ungainly and savage brute guarded with much care and jealousy by an attractive little bird. These are the rhinoceros and his faithful attendant the red beaked ox-biter, more popularly known as the rhinoceros bird. These birds which belong to the great raven family are, to use Gordon Cumming's words, "the best friends the rhinoceros has." They cling to him through good and evil report, watch over him by day and perch upon him by night; never leaving him—in fact as long as he has a tick to his hide. *Ticks*, which infest the forests of most parts of the earth and are particularly painful and enterprising in Africa, cause the most exquisite agony to the rhinoceros, hippopotamus and elephant, notwithstanding the seeming protection of their very thick skin. The beak of the ox-biter is so constructed as to render the extraction of a deeply embedded tick only a pleasantly difficult task. The ungainly recipient of the bird's attentions is duly grateful, and never, even when suffering great pain, from the probing beak, offers any remonstrance, but rather shows by the liberties it permits the implicit confidence it reposes in its attendants. He is not content to extract the parasites from the easy and conspicuous spots, but hops with great care all over his huge charge, now thrusting his inquisitive beak into this ear, now hopping over the head and inspecting the other, now examining the corners of the mouth, and next wisely seeing that the region of the eyes is safe. Nor do they limit their duties to parasite inspection. They watch over his slumbers and warn him by vociferous crying of the approach of an enemy, and when noise fails to arouse him they fly at his face and flap it with their wings.

This bird is found only in Central Africa, but there is in South Africa, a near relative known as the African ox-biter, which performs very much the same office in its own territory."—*John R. Coryell in Harper's Magazine, 1884.*

Selected by Ladies' Auxiliary Committee, S. P. C. A.]

The Robin in an English Church.

It was the night before Christmas, in England, and snow was falling. They did not mind it in happy homes, where lamps were lighted and fires burned cheerily, and tables were spread for tea. But a little robin, cold and hungry, hopped about wearily, seeking shelter and food. Our robins fly away south before snow comes, but this was across the sea, where the robin stays all the year.

The little bird lighted on window-sills and tapped with its beak, but was seldom heard. Once two little girls looked out of the window and saw him, but it was so very cold that they quickly ran to the warm fire and birdie flew away.

After a while an old man came along in the path that led up the village church. Robin hopped behind him, and when he opened the door birdie was close by and went in without being noticed. Oh, how warm and comfortable the church was! The Sunday-school children had been there with their teachers trimming the church with holly and mistletoe, and singing Christmas carols. The fire was to be kept all night that the church might be warm for the Christmas service. The old man put on fresh coal and went home. Birdie hopped about in the fire-light, picking up some crumbs he found on the floor. Some cakes had been given to the children. How welcome this supper was to the hungry robin you can guess. Then he perched on the railings of the stairs and tucked his head under his wing—a very sleepy and happy bird. In the morning his bright eyes espied, first thing, the scarlet holly berries. There was indeed a royal feast in robin's eyes, enough to last for many weeks of wintry weather.

The hours flew on and the happy children came and sang their Christmas carols.

Just as the first verse was finished, a clear, rich, joyous song burst from birdie's little throat, high above among the green branches. No one had seen him and what a sweet surprise! The minister raised his hand to keep silence while birdie sang, and then, opening the Bible, read in reverent tones:

" 'Yea, the sparrow hath found a house, and the swallow a nest for herself, where she may lay her young: Thine altars, O Lord of hosts!' "

"This time," said the minister, "our favorite bird, our little Robin Redbreast, has found a lodging and breakfast in the church where we come to pray for our daily bread. Snow is all around, covering the ground and bushes; he was cold and hungry and might have perished in the storm, but the good All-Father, in His pitying love and tender care, guided the tiny wings hither."

"The little bird praises Him in its joyous song. Shall not we, with far greater reason, praise Him gladly?"—*New Orleans Picayune.*

Important Sanitary Information.

Science sums up the Report of the Paris Commission on consumption as follows:—

Tuberculosis is, of all diseases, that which has the most victims, especially in the cities. More than one-fourth of the mortality of Paris, during the year 1884, was from tuberculosis in some of its forms. Tuberculosis is a parasitic, virulent, contagious, transmissible disease, caused by Koch's bacillus. The microbe penetrates the organism by food, by air of respiration, and through the skin and mucous membranes by abrasions, excoriations, and divers ulcerations. Certain diseases, as measles, chronic bronchitis, pneumonia; certain constitutional states due to diabetes, alcoholism, syphilis, predispose to tuberculosis.

The cause of tuberculosis being known, there is but little difficulty in preventing its dissemination and propagation if proper prophylactic means are taken. The parasite of tuberculosis may infect the milk, muscles, and blood of animals which serve for the food of man. Raw meat, underdone meat, blood, may contain the living germ of tuberculosis, and should be interdicted. For the same reasons milk should be boiled before being ingested. By reason of the dangers which attend the use of raw milk, the protection of young children, who are so susceptible to tuberculosis should earnestly engage the attention of mothers and nurses.

By reason of the dangers which attend the use of butcher's meat, which may come from animals which were tuberculous, though having every appearance of health, the public should insist that the inspection of all meats, as required by the law, should be rigorously enforced. The only sure way of avoiding the dangers arising from meat derived from tuberculous animals, is to subject such meat to a thorough cooking, which shall include the entire substance in depth as well as the surface. Meats completely roasted, boiled, or broiled are alone safe.

As the germ of tuberculosis may be transmitted from the tuberculous to the healthy man by sputa, pus, dried mucosities, clothing, or other objects impregnated with fine tuberculous particles, it is necessary for the public, in order to be protected against the contagion:—

(1) To know that the sputa of phthisical patients being the most formidable agents of the transmission of tuberculosis, there is danger in allowing these expectorated matters to be deposited on the ground, on carpets, on drapery, screens, towels, handkerchiefs, clothing and bed linen.

(2) To be persuaded that the use of spittoons is obligatory on all phthisical patients everywhere. Spittoons should always be emptied into the fire and cleaned with boiling water. They should never be emptied on dung heaps, on garden soil (where they may tubercularize fowl) nor into privies.

(3) To refrain from sleeping in the bed of a tuberculous patient; to remain as little as possible in a room occupied by such a person. This caution is especially applicable to young children.

(4) To sequestrate from all places occupied by phthisical patients, individuals considered as predisposed to tuberculosis, children born of tuberculous parents, or that have lately had measles, small-pox, pneumonia, etc , and all diabetic patients.

(5) To avoid using objects which a phthisical patient may have contaminated—garments, bed-clothing, toilet implements, play-things, etc., till after previous disinfection, in the hot-air stove, by boiling water, sulphur fumigations, etc.

(6) To insist that the rooms of hotels, furnished houses, cottages occupied by phthisical patients at watering places or winter stations, shall be equipped and tapestried in such a way that disinfection may be easily and completely effected after the departure of each patient. It would be better that these apartments should have no hangings or tapestry, and that they should be whitewashed. The floors should be bare, either oiled or painted. Hotels and furnished cottages in which such hygienic precautions and measures of disinfection are taken should alone be patronized by the public.

German Pension System.

The German government acts on the principle that the teacher is an officer who has served his country, and when he is no longer fitted for service it is incumbent upon the state to care for him. The chief points of the pension system are as follows:

After ten years' service each teacher is entitled to a pension equal to one-quarter of his salary at that time, should he be obliged to discontinue. To this $\frac{1}{4}$ $(\frac{20}{80})$ $\frac{1}{80}$ is added for each year's service thereafter. Thus, if after ten years he continue yet thirty years, he adds $\frac{30}{80}$ to his $\frac{1}{4}$, making $\frac{50}{80}$, or $\frac{5}{8}$ of his salary at the end. Should his salary be $800, he can retire on an annual income of $500. Thus, when a young man has become a teacher he is encouraged to continue, because his salary increases from year to year; thus recognizing the value of experience; 2. His pension increases year by year; 3. He has a permanent place as long as he lives; 4. He is held in high respect by all; 5. He has a field of real usefulness where he can devote himself with definite purpose to reach certain ends and then see the fruits of his labors.—*The Practical Teacher.*

A Serious Loss.

It seems strange that facts which are so plainly evident to one person should sometimes be wholly incomprehensible to another. Nothing is clearer, for instance, to one who has give the matter any attention, than the loss farmers suffer annually from the poor teachers who are too generally found in the country schools. Progressive and thoroughly prepared teachers can do an incalculable amount of good in waking up the children with whom they come in contact, to the importance of putting mind into whatever they undertake in after life. The country boy and girl are in great danger of being overmastered by tradition, and nothing will be more valuable than the habit of mind which is not willing to follow the old-fashioned way of doing without asking the reason of it. It is constantly repeated that farm lands are deteriorating, or at least, not keeping pace in value with the increase in town property. This unfortunate condition of affairs can not be justly charged upon the country school. But the country school ought to be a centre from which intelligence should be diffused. It ought to furnish the children with a fair amount of knowledge, and, above all things, it ought to impress them with the important fact that in material things intelligence always wins. It cannot be expected to teach agriculture, but it may very properly be expected to insist upon the fact that if farming is to carried on successfully it must be carried on intelligently. It cannot be expected to teach entomology, but it should lay stress upon the importance of an intelligent study of insects, and indeed of all animal existence. A vast amount of valuable material bearing upon farm life is sent out every year by the General and the different State Goverments, but it is of benefit to a very small number of persons because the vast majority of farmers care nothing for it and do not know how to use it when put in their hands. The district school is the most difficult educational problem at present demanding a solution, and the most discouraging phase of the situation is the fact that those who should be most interested are the most indifferent.—*Journal of Pedagogy.*

A Device in Discipline.

The writer recently spent a little time with H. G. Woody, principal of the Kokomo (Ind.) high school. His school room was crowded, there being five more pupils in attendance than there were seats in the room. Yet the order was perfect. Not a whisper—not a note passed—no side glances—simply an earnest attention to business. There were frequent consultations of dictionaries, encyclopedias, and other reference books, but no communication. Each pupil seemed interested in his own work and attended strictly to his own business. It was simply a model school.

In this school each pupil keeps his own record of both conduct and study, in a little blank book prepared for the purpose, and makes daily entries. This is not the the "self reporting system," because the pupil's standing is not made up from this record. The pupil does not report to anybody; he simply keeps the record for himself. The principal frequently looks at these little books to see how they are kept, but never criticises the marking. The pupil is not required to show his books to his parents, and yet he is encouraged to keep a report that he will not be ashamed to show. The pupil is given to understand that the record is for his own benefit exclusively, and that it is for his own inspection exclusively, unless he chooses to let others see it.

It seems to the writer that the above named device is an excellent one, for two very manifest reasons:

1. It compels the student to constantly compare his own performances, in both conduct and work, with his own ideal standard of excellence, and this is worth a great deal to any one, whether in school or out of school.

2. It places no inducement before the pupil to make a false report, and this gives it its immense advantage over the "self reporting system."

Let no teacher flatter himself that this device or any other, however good, will run itself.—*Indiana School Journal.*

The Spelling Class.

"How do you teach spelling?" asked Miss A. of Miss B., the senior teacher in the village schools.

"Well," she replied, "I think some learn to spell by sight and some by sound and some by a combination of the two. That is, we recognize the correct or incorrect spelling of a word just as we do a correct or an incorrect picture of a man. If a letter is gone in one case or an arm in the other, the picture is imperfect."

"But how does a child first come to know a *correct* picture of a word?" asked Miss A.

"By frequently seeing it and writing it. In reality he learns words as he learns faces."

"But are not some children very dull about perceiving and remembeing exact forms?" again queried Miss A.

"There is no doubt about that," was the reply, "and also in the recognition of sounds and there proper order. Some never know one tune from another, and they easily forget the order of sounds in the spelling of a word."

"Miss B., please tell us how you have your class study and recite?"

"My grade, you know, is third year. My methods might not be adapted to higher grades, but this is what I do. I write the words on the board and have the pupils begin their study by spelling and pronouncing each word three times in concert and aloud. This is the *ear* work. Then they spend fifteen minutes in writing the words on their slates, copying from the board. This is the *eye* work. Then they recite by erasing the words from their slates and writing while I pronounce. While doing this the words upon the board are covered by a small curtain that slides upon a wire. After the spelling I pass around and mark the misspelled words, then draw back the curtain, have the slates cleaned, and the missed words reviewed by writing them several times upon the slates, after which the pupils come to me singly and spell the words orally. Then about once a week I give for a lesson only these words that have been misspelled."—*Intelligence.*

Latin.

There are moments or hours in every Latin class when a little diversion is as necessary as enjoyable. At such a time a Latin joke does good service. If the pupils can translate it they have gained considerable amusement and an equal amount of Latin. A class beginning Cæsar will quickly appreciate the following:

It was the custom in a certain school to give a topic each day for a Latin essay. The topic had been assigned, "Brutus, Cæsare interfecto an bene fecit, aut male fecit?" One boy came in late, the dinner hour was drawing nigh, he aimed to be as brief as possible, and wrote:

"Nec bene fecit, nec male fecit, sed interfecit."

Again the story is told of Burke that once while snuffing a candle, he put it out; he aptly quoted from Ars Poetica:

"Brevis esse laboro, obscurus fio."

Some one, on being told that a young lady studying thorough bass, had mastered it in three weeks, said:

"Nemo repente turpissimus fuit."

Poetry is a pleasant diversion, and the nursery ryhmes, though they do not profess to be classic, are a delight to beginners. After a few weeks' work in Latin "O Miss Mary" can be easily translated:

"O Mea Maria,
Tota contraria
Quid tibi crescit in horto?
Testae et crotali
Sunt mihi flosculi
Cum hyacinthino serto.'

The prayer of Mary, Queen of Scots, written on the morning of her execution, is more serious, but simple to read:

"O domine Deus
Speravi in te,
O care mi Jesu,
Nunc libera me!
In dura catena
In misera poena
Desidero te.
Languendo, gemendo,
Et genu flectendo,
Adoro, imploro
Ut liberes me."

Allen's Latin Primer contains a number of such little selections. Common phrases and maxims from the Latin may be constantly put before the class to their pleasure and profit. The pupils themselves may contribute these. Webster's dictionary contains an abundant supply. A page of the Testament is an exercise in sight reading. As the pupil advances in the work, quotations from the classical writers may be used. Horace abounds in gems. His ode on the "Return of Spring," or the one "To a Ship," or "To Pyrrha," may be given to a class at a time when for some reason the regular lesson has not been prepared. With some aid from the teacher, the poems may be read at sight.

Another device is to place before the class a page of simple French, not telling them what it is, then to let them translate it from their knowledge of the Latin. The results are astonishing, and the method is another "practical" application of the dead language.

All this, of course, is to be done so as not to interfere with the prescribed work. The expedients have all been tried and found good. They often serve to keep spirit in a class, and hence secure better work, for

> "A merry heart goes all the day,
> Your sad tires in a mile-a."

—*Public-School Journal.*

An Oxygen Explosion.

An accident which occurred in Lexington, Ill., gives sad emphasis to the necessity for care in conducting chemical experiments. Professor J. Jess, of the high school, started to make oxygen for his chemical class. He used as a retort a piece of gas pipe eight inches long and two inches in diameter. On applying heat for a short time an explosion occurred, and the retort blew up like a bomb shell. The room was wrecked, Professor Jess and several others were terribly injured, while about twenty were included in the list of wounded.

The probabilities are that the chemicals were impure. About twenty years ago a similiar accident happened at the School of Mines, Columbia College. The experimenter had by mistake mixed sulphide of antimony, instead of binoxide of manganese, with chlorate of potash. On applying heat the mixture in the retort exploded and the experimenter's sight was permanently destroyed. Oxygen can with perfect safety be generated in a glass retort, flask, or test tube, but the mixture of chemicals should always be tested by heating a small quanity in the bottom of a test tube. If it evolves oxygen quietly, the oxygen mixture may be considered correctly made. Sulphide of antimony and binoxide of manganese are so similar in appearance that the mistake described above is one always liable to happen, and the result is practically gunpowder or worse. Organic matter or sulphur may bring about a similar result.—*Scientific American.*

Reading Music At Sight.

The people are beginning to ask why it is that their children are not taught to read music. They know they have good voices because they learn songs, and sing them well. But they also know that they are wholly dependent upon some one else to teach them the songs by rote. It is certainly a misfortune, with all we have done, and all we are doing in education in general, that pupils are allowed—compelled is a better word—to stay from four to twelve years in school, and not learn to read music, and with the same facility that they learn to read their mother tongue. Give the pupils proper teaching, and *one-fourth* of the time that is spent in any other branch, and the results in music will be most satisfactory. There is no excuse for this poverty stricken business, for every teacher that can teach reading, can teach singing.—*Public-School Journal.*

The Beginning of a Bottle.

The process begins with the gatherer. His blowpipe is a tube of wrought iron five or six feet long, and of lighter weight than the pipe used in blowing window glass. He dips the end of his pipe into the molten contents of the boot, and brings out a mass of red-hot plastic glass. If the bottles to be blown are small, one gathering suffices, but, for larger wares, two or even three gatherings may be necessary to get the requisite supply of material on the end of the blowpipe. When the gathering is done properly, this lump of red-hot glass is a perfectly homogeneous mass. Its subsequent fortunes rest with the blower. He takes the blowpipe from the gatherer, and, resting the plastic glass against a marvering table of stone or cast iron, he gives the pipe a few adroit rotations, thus fashioning the glass into an even cylindrical shape. By further rolling it along the edge of the table he forms the smaller prolongation of glass which is afterward to become the neck of the bottle. Lifting the still red-hot glass from the table, he blows through the pipe, forming a small bubble of air in the interior of the mass of glass. This is afterward extended until it becomes the inwardness of the bottle.

The partly fashioned bit of glassware is now introduced into the mold which one of the "shop" boys has already opened to receive it. For convenience in working, the mold is placed on a somewhat lower level than that on which the blower stands. It is made of cast iron, and is commonly formed in two pieces. One of these is stationary, while the other opens outward, its motion being controlled by a foot lever. When the blower places his incomplete bottle, still attached to the blowpipe, into the mold, he closes the mold with his foot, and blows through the pipe until the plastic glass is everywhere forced against the sides of the mold and has impressed upon it the form of its prison.—*From "The Evolution of a Glass Bottle," by Prof. C. H. Henderson, in the Popular Science Monthly for December.*

EDUCATIONAL OPINION.

School boards and school officers would deserve and receive the benedictions of coming generations if they supplied to pupils, during the eight years of their common school course, proper hygienic conditions—rooms capable of ventilation without hurtful changes of temperature—seats and desks so constructed as to facilitate order and to prevent deformity—light, suitable in direction, quantity and color—systematic and frequent exercises in gymnastics, calisthenics, and military movements—school sessions giving abundance of time for a regular, deliberate midday meal. Managers of schools incur a fearful responsibility when, thoughtlessly neglecting to provide for those under their care, they entail upon them those sufferings which such neglect certainly produces.—*Supervisor McKay.*

He who can express his thoughts readily, correctly and felicitously, and who has thoughts worthy of expression, occupies a much-to-be-desired vantage ground in the warfare of life. I fear that some of our teachers are not sufficiently impressed with the importance of this group of subjects. They are too often content with fragmentary answers, barely indicating that the pupil possesses the requisite knowledge .They do not insist upon full and grammatically complete answers which would develop bowers of expression. Familiar conversations in which the pupils take part, descriptions by them in their own words of what they observe, frequent written abstracts of their lessons, in history and in science of common things, would give them an easy mastery of their own language.—*Supervisor McKay.*

$10.000 TO DALHOUSIE.—The late John P. Mott of Halifax, among many other public bequests, left ten thousand dollars to the university of Dalhousie, College.

AMONG THE SCHOOLS.

The teachers of New Glasgow—twelve in number—have organized themselves into a local association which meets on the last Friday of each month. At the first meeting, January, Principal E. Mackay read a short paper outlining the work that the Association might accomplish, and emphazing in particular the opportunities it afforded for scientific work. During last month the teachers have been reading Inspector Hughes' little work on "Mistakes in Teaching" and at the last monthly meeting Miss Nettie Forbes, of the High School Staff, read a very suggestive paper on the same subject. Miss Forbes supplemented the list of teacher's weaknesses noticed in Mr. Hughes' book by indicating several other "mistakes" to which the profession is liable. An interesting discussion followed, after which Mr. McKay gave a lesson on Limestone and Miss Forbes outlined work in Botany suitable for March. The programme for the March meeting will include papers on professional subjects, science lessons and a lesson in school calisthenics.

The teachers of Amherst have organized for study. Their present course of study is Fitch's Lectures on Teaching, for professional work; and the critical study of Macbeth in the department of literature. After they finish Macbeth, they intend to follow a course of science study to prepare for the Summer School of Science.

Springhill has one of the finest school buildings in the province; Truro has just completed a handsome High School building, according to the most approved ideas; and now Amherst is thinking about a new building. A fine site of about four acres has been secured and a large brick or stone building is being talked of to be completed about November, 1891.

PERSONAL.

Stanley Mackenzie, B.A., (Dal.) has been awarded a scholarship of $200 at the Johns Hopkins university.

The Halifax Academy is making a shade of sensation in the lecturing line. W. T. Kennedy, Junior Classical Master, drew the largest house of the season in the Y. M. C. A. course on the 25th February, subject: "Some Laws of Nature Suspended: the Consequence." The climax was attained, however, on March 4th, when Howard Murray, Senior Classical Master, filled the house so that many were unable to get standing room: subject. "A Wife or a Library, Which?"

QUESTION DEPARTMENT.

Questions and Answers.

N. S. M., ENGLISH CENTRE, PENNSYLVANIA.—1. A man standing on a globe. six feet in diameter, has his eye six feet above the surface of the globe, how much of the plane surface on which the globe rests is hidden by it from his eye?

(*Geometrical solution*). Draw a circle with any radius touching a horizontal line at A. From A draw the vertical diameter AB. Produce AB upwards to C, making CB=BA. From C draw a tangent to the circle at D. Produce CD to meet the horizontal line in E. The horizontal represents the plane, the circle the globe, C the position of the eye, and the circle described with the radius AE the portion of the plane hidden from the eye at C.

(*Algebraical solution.*) Let $AE=x$, then (Euc. III. 36 Cor.) $ED=x$. But by Euc. III. 36, $CA\times CB=CD^2=12\times 6$ ft. $=72$ ft. $\therefore CD=\sqrt{72}=6\sqrt{2}$ $\therefore CE=x+6\sqrt{2}$. But by Euc. I. 47, $CE^2-CA^2=AE^2$, that is, $(x+6\sqrt{2})^2-12^2=x^2$ (1)

(1) Expanded, $x^2+12x\sqrt{2}+72-144=x^2$ (2)

(2) Transposed, $12x\sqrt{2} = 72$ (3)

(3) $\div 12\sqrt{2}$, $\therefore x = \frac{6}{\sqrt{2}}=3\sqrt{2}$ (4)

But $x=$ radius of the circle of obscuration. $\therefore$ Area of circle of obscuration = (Pi) $x=31\cdot4159\times3\sqrt{2}=3\cdot14159\times3\times1\cdot4142=13\cdot3285+$ square feet.

2. In a room 40 feet long, 20 feet wide and 10 feet high, there is a rope 50 feet long, one end of which is fastened to the corner of the ceiling, and the other end fixed in the opposite (diagonal) corner on the floor. How many feet from the corner on the floor, under the ceiling corner, where the rope is fastened. will the rope touch the floor along the wall, *i. e.*, by pulling the rope down to the floor along the wall by the length of the building?

Let x feet = the required distance. Then square of height of room$+x^2=$ square of length of rope in air (Euc. I. 47). That is, $\sqrt{x^2+100}=$ length of rope in air $\therefore 50-\sqrt{x^2+100}=$ length touching floor along the 40 foot wall. Remaining length of 40 foot wall $=40-(50-\sqrt{x^2+100})=(\sqrt{x^2+100}-10)$. The square of this+the square of the breadth of the room (Euc. I. 47) also$=x^2$. That is

$$(\sqrt{x^2+100}-10)^2+20^2=x^2. \qquad (1)$$

(1) Expanded—

$$x^2+100-20\sqrt{x^2+100}+100+400=x^2. \qquad (2)$$

(2) Coll. and Trans., $-20\sqrt{x^2+100}=-600.$ (3)

(3) $\div -20$, $\sqrt{x^2+100}=30.$ (4)

(4) Squared, $x^2+100=900.$ (5)

(5) Trans. and Coll., $x^2=800.$ (6)

(6) Sq. rt. ext., $x=20\sqrt{2}.$ (7)

$\therefore x=28\cdot284+$ feet. (8)

3. Buell and MacKenzie agreed to dig a ditch 100 rods long for $100. The part of ditch MacKenzie had to dig was more difficult of execution than Buell's Buell said, "I'll throw of twenty-five cents per rod on mine and give it to you; and you dig the worth of $50 @ $1.25 and I'll dig the rest." They should receive respectively $1.25 and $0.75 per rod. How many rods should each dig?

Let x=number of rods dug by MacKenzie @ $1.25.

Then $\$1.25\times x=\$50.$

$\therefore x=\frac{50}{1.25}=40$ rods.

And $(100-x)$ number of rods dug by Buell$=(100-40)=60$ rods.

L. A. M., HANTS. 1. Who were the Arundel poets, and why were they so called?

1. Poets whose works were published in an edition called the "Arundel Poets." Name probably suggested by the famous patronage of the fine arts by the Earl of Arundel.

2. Who was the author of the "Keepsakes" and "Amulets" mentioned in the notes on Robert Browning in January REVIEW?

The "Keepsakes" and "Amulets" were artistic publications of selections from the best poets very popular in England about sixty years ago.

3. Do the "pointers" always point to the North Pole star. or does the "handle of the Dipper" ever point to it?

This problem should be solved by observation. The "handle of the Dipper" swings around the North Pole star once in 23 hours and 56 minutes approximately. But as the positions of all the stars are fixed, with respect to each other, the Dipper cannot curl up its handle to take the place of its nose — the "pointers," which, of course, must always point towards the Pole star.

S. S. S. Is there not some confusion in the February REVIEW with respect to the Secretary of the Summer Science School, *et cetera?*

There is. The proof-reader of his own motion changed the signature *A. McKay* to that of *A. H. MacKay* in the "Circular to Halifax Teachers" and the advertisement of the Summer School, probably under the impression that there was but one MacKay —the *Principal*. But there is a greater than he— the *Supervisor* of the public schools of Halifax, *A. McKay*, also Secretary of the Summer School of Science.

A. P.—A. owes B. $729.18 due to-day. A proposed that he should pay $183.14 and have the payment on balance extended for four months, interest to be paid at the rate of 10 per cent in advance, said interest to be taken out of the $183.14, the balance to be paid on note, Point at issue: What are the respective amounts for interest and credit on note?

10 % per annum = $3\frac{1}{3}$ % for 4 months. \$729.18 − \$183.14 = \$546.04, which is $96\frac{2}{3}$ %, ($100 - 3\frac{1}{3}$) of the amount on which interest is to be charged.

Therefore, \$546.04 ÷ $96\frac{2}{3}$ = \$564.87, the amount on which interest is to be charged.

\$729.18 − 564.87 = \$164.31, the amount paid on principal. \$183.14 − \$164.31 = \$18.83, the interest paid in advance.

Proof.—4 months' interest on \$564.87 = \$18.83.

S. K.

LITERARY NOTES.

Ginn & Co., Publishers, Boston, will issue shortly a work on Structural and Systematic Botany, for high schools and elementary college courses. It is designed to serve as both a laboratory guide and an outline of the classification of the vegetable kingdom.

To this end a number of typical plants have been carefully selected and these studied in detail, with full directions for gathering or growing the specimens as well as for the study of their structure This work is supplemented by a brief diagnosis of the group to which each plant belongs, with such descriptions or figures of related forms as will enable the student to recognize the common forms likely to be met with, as well as the relationships of the different groups of plants.

Ginn & Co will publish in April "The Best Elizabethan Plays," edited with an introduction by William R. Thayer. This volume appeals to the general reader who wishes to get, in small compass, the best products of the Elizabethan Drama (exclusive of Shakespeare), and also to the students in academies or colleges, who are studying this most important period of English literature It is a work equally well adapted to the library and to the class room.

BOOK REVIEWS.

A Text-book of Animal Physiology, with introductory chapters on General Biology and a full treatment of Reproduction, for Students of Human and Comparative (Veterinary) Medicine and of General Biology, by Wesley Mills, M. A., M.D , L R C. P. (Eng.), professor of physiology in McGill University and the Veterinary College, Montreal; with over 500 illustrations. pp XXII + 700, 8vo. New York: D. Appleton & Co , London; Caxton House, Paternoster Square, 1889. (Also, E. M Renouf, 2238 Saint Catherine st., Montreal). Although this volume bears the imprimatur of the great publishing house of New York upon it, in its superior typographical finish it is a Canadian work — one which will reflect no little additional lustre on the growing reputation of the great Canadian University of McGill, and one which will give much satisfaction to those who like to see our own people take a leading position in the progress of the world. Professor Mill's work is admirable on account of his clear style, the concise and forcible presentation of his points, their logical succession, the skill with which his illustrations are utilized and the demarcation between the latest proven facts and hypotheses But we specially admire the wide sweep of his treatment of the observed laws of life. All flesh is laid under tribute to discover the mysteries of those ills to which the human flesh is heir. The bone, the blood, the muscle, the nerve of man, grow, and live, and die, much as in other animals. Reproduction, assimilation, action and decay are common to each in very similar forms. Why this similarity? Our experience teaches us—the more fully we explore the more profoundly we feel it—that nothing in nature is meaningless. The study of the laws of life in the lower animals is giving a knowledge of human life where it would be impossible to obtain it by direct observation and experiment. This work lays a broad foundation for a sound medical knowledge of human physiology. It is equally valuable to the zoologist and to any who desire to have a knowledge of the latest presentation of the principles of general biology. The author distinctly adopts the evolutionary hypothesis as the most profitable for the correlation of the observed facts. This treatment if persisted in, with severe and accurate observation and experimentation, cannot fail before long to show the sufficiency or insufficiency of this hypothesis. Truth is mighty and will finally prevail. This work will, we have no doubt, do much towards revolutionizing the method of studying animal physiology. The comparative biological and evolutionary points of view from which it is written, will call attention to it everywhere. We see by one of our exchanges that permission has been asked for its translation into German.

A German Reader for Beginners in School or College with notes and vocabulary by Edward S. Joynes, M.A , professor in South Carolina University, pp. v, + 277, 12mo., (Boston, D. C. Heath & Company, 1890) The publishers have in this volume produced a beautiful specimen of the typographical art, and a handsome and strong binding. The reader commences with interlinear translations, then passes on to a well graded selection of simple readings in prose and poetry. The selections are principally in the German letter, new orthography; but there are also selections in Roman letter, and a few in the old orthography. Its useful and copious notes, beautifully printed vocabulary, and skilfully graded selections can hardly admit of a superior under 300 pages.

Æschines against Ctesiphon. Edited by Prof. Richardson, of Dartmouth college. Publishers, Ginn & Co , Boston and London. This celebrated oration, the companion piece of Demosthenes' On the Crown, will always be of interest to the readers of ancient classics. The attractive form in which it is now published by Messrs Ginn & Co , the excellent typographical appearance, with copious notes and vocabulary, will enhance its value in the eyes of the student The basis of this edition by Prof. Richardson, is the German edition of Weidner, and his commentary has been freely modified to meet the needs of advanced college students in America.

The New Arithmetic. Edited by Seymour Eaton. Boston: D. C. Heath & Co , publishers. If there is wisdom in a multitude of counsellors this book should bear the palm over all other texts on arithmetic It is the product of three hundred authors. It has very little theory but is practical to the fullest extent. The preface to the work by Prof Stafford of William's College has many excellent points, worthy the thoughtful consideration of those who would teach arithmetic successfully.

RECEIVED.

LABORATORY MANUAL OF EXPERIMENTAL PHYSICS. C W. Bardeen, publisher, Syracuse, New York.

ELEMENTARY CLASSICS; Livy, Book XXI, MacMillan & Co., publishers, London and New York.

LABORATORY MANUAL OF EXPERIMENTAL PHYSICS. Arey. (C. W. Bardeen, Syracuse, 1890)

TEACHER'S MANUAL OF FRACTIONS. Ginn & Co., publishers, Boston.

FREETAG'S AUS DEIN STAAT. D. C. Heath & Co., Boston, Mass,

PUBLICATIONS RECEIVED.

In *Wide Awake* for March is an Acadian Story, "The Kaduskak Giant," the scene of which is laid near Lake Rossignol, N. S.; time, 1795....In *Bookmart* for February are two excellent articles. One on Browning and the other a criticism on Tennyson's latest volume....The *Century* for March has for its leading article the continuation of the "Autobiography of Joseph Jefferson," the illustrations of which are even more excellent than usual....The *Popular Science Monthly* for March has a fine table of contents In an editorial, "How to make Knowledge Real," there is a strong protest against mere book teaching in science....*St Nicholas* for March opens with an exciting sketch, "On a Mountain Trail." The table of contents and the illustrations are as usual excellent....The *Scientific American* for March 1st has an interesting article with illustrations on the Artesian Wells of Riverside, Cal....Among the valuable articles in *Garden and Forest* for Feb. 26th, are "Botany for Young People,' "An Alley in the Tuilleries Garden, Paris," "Mocking at Knowledge," etc. A trial subscription for three months for fifty cents, will secure thirteen numbers of this excellent journal. Address *Garden and Forest*, New York.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

ZOOLOGY, 8 lectures By Principal A H MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.

BOTANY, 8 lectures—By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.

MINERALOGY, 8 lectures—By A J. Pineo, A. M, Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.

PHYSICS, 8 lectures—By Principal E McKay, New Glasgow.

CHEMISTRY, 8 lectures—By Prof. A E. Coldwell, Acadia College, Wolfville; assisted by W. E. Kennedy, Esq., Halifax Academy.

PHYSIOLOGY, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville

GEOLOGY, 4 lectures—By Prof. Kennedy, Kings College, Windsor.

ASTRONOMY, 4 lectures—By Principal Cameron, Yarmouth Academy.

TONIC SOL-FA—Miss A. F. Ryan, St. Mary's School, Halifax.

ELOCUTION—By Miss H. E. Wallace, Acadia Seminary, Wolfville.

MODERN LANGUAGES—By Herr Lothar Bober, Halifax.

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Secretary Summer School of Science,
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Halifax, 7th February, 1890.

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The Calendar for the Session of 1889 90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 16th. 1889).
Donalda Special Course for Women—(Sept. 16th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
Faculty of Medicine—(Oct. 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

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Devoted to Advanced Methods of Education and General Culture.

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A. H. MacKAY, B. A., B. Sc.,
Editor for Nova Scotia.

ALEX. ANDERSON, LL.D.,
Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

EDITORIAL NOTES.

In future, subscribers to the REVIEW in Nova Scotia and Newfoundland should send their subscriptions and all business communications to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other subscriptions and business communications should be addressed, Editor EDUCATIONAL REVIEW, St. John, N. B.

A VALUED correspondent writes: "I also take this opportunity of saying that I find the "Book Reviews" of much interest, and that I eagerly consult the advertising columns of the REVIEW for information as to new books, etc., bearing on my every day work."

ON March 31st the School for the Blind of the Atlantic Provinces gave an exhibition of the ordinary gymnastic exercises which, for the last eight years, were conducted under the special charge of Sergeant-Major Bailey, of the Imperial forces. Both ladies and lads showed well developed physical powers, and as full an enjoyment of it as a club of cricketers. Under Principal Frazer's inspiration, eleven years ago, physical training was introduced; and after the publication of his report this essential part of an education has been extensively introduced with the best effects into similar institutions all over the world. After the calisthenics came a short musical entertainment, the presentation of medals, with an address, and a presentation of a silver cup from the pupils to Sergeant-Major Bailey, who is about to return to England. The Atlantic Provinces have the best reasons to be proud of this school and its intelligent management. The enthusiastic principal hopes to have its accommodations doubled during the present year. Could the people of these provinces only become acquainted with the superior work done by this institution, any accommodation required would be meted out with the most ready and liberal hand. In a note of this kind we cannot even attempt to describe what an education our blind are now capable of receiving.

THE following gentlemen from the Atlantic Provinces have passed the necessary examinations and are entitled to degree M. D., C. M., of McGill University: G. A. B. Addy, St. John, N. B.; C. P. Bisset, River Bourgeois, N. S.; J. Broderick, Fredericton, N. B.; J. W. Clarke, Tatamagouche, N. S.; F. G. Corbin, Halifax, N. S.; Curtis Harland, N. B.; W, E. Jenkins, Conquerall Bank, N. S.; A. C. Lewin, St. John, N. B.; H. H. McKay, Pictou, N. S.; A. C. McLellan, Prince Edward Island; H. D. McManus, Fredericton, N. B.; James Ross, Halifax, N. S.; W. A. Wilson, N. B.; E. S. Yorston, Truro, N. S.

WE are glad to learn that the Nova Scotia parliament is likely to give us an amendment this winter which will enable school-boards to establish kindergartens under the general educational system wherever they may be likely to be required.

THE N. B. *University Monthly* will begin in its April issue a series of sketches on the past graduates of the university. These, when completed, will be used in compiling a memorial volume, which is intended to be a complete history of the university since its foundation. The editors of the *Monthly* deserve great credit in taking the initiative in such a step as this, and it is to be hoped that the friends of the university everywhere will aid them in securing the information required to complete such an important and desirable contribution to provincial history.

There is every prospect that a number of teachers from New Brunswick will attend the Summer School of Science which meets at Parrsboro in July. The opportunity to study science pleasantly and at the same time enjoy a holiday in one of the most interesting portions of the Atlantic Provinces should draw together a number of enthusiastic students.

The announcement is made in another column of the Summer Schools of Harvard University. The School of Botany will be under the charge of Mr. W. F. Ganong. With the excellent facilities afforded by the Botanic Gardens at Cambridge and the enthusiasm and devotion that Mr. Ganong brings to his work, this is a good opportunity to spend a few weeks profitably and pleasantly.

In the new advertisements in this month's Review, Supt. Crocket calls attention to the educational exhibit for N. B. Schools, in St. John, September, 1890, and Messrs J. & A. McMillan and Alfred Morissey advertise requisites for schools preparing for the exhibition; Messrs Ginn & Co., and D. C. Heath of Boston have announcements of new books for school and college; Chas. K. Short, St. John, advertises Dyspepticure, and Harvard University gives notice of its Summer Schools.

EDUCATIONAL REFORM.

Hitherto we have directed the attention of our readers to the financial aspect of the question. In our review of the subject so far, we have shown that there can be little hope of permanent and satisfactory results so long as the occupation of the teacher is merely a temporary employment, and that the only effectual remedy is the offer on the part of the school boards of such stipends as shall induce the teacher to adopt an educational career. We are well aware of the difficulties which stand in the way of such a reform, and we are not sanguine enough to believe that the change can be effected at once, but we do trust that there is sufficient intelligence and public spirit among the people of the Atlantic provinces to apprehend the reasonableness of our plea, to realize the stupendous interests which are at stake, and to initiate some scheme, honest, broad, and practicable, which in its operation shall ameliorate the position of the teacher and thereby greatly promote the cause of education.

It was perhaps necessarily incident to the advent of a national system of education that whilst the general control was retained by the government, the management of the schools in each school-district should be vested in a board really or virtually elected by the people. The selection of the teacher, the maintenance of the school-building, and the oversight of educational matters in the school-district, contribute to create and foster an interest in them which it would be very difficult otherwise to accomplish.

Those parents who have children to educate are anxious to maintain or increase the efficiency of the school, while those who take a pride in their settlement, village or town, in its intelligence, respectability, and enterprise, co-operate with them in electing representatives to the Board in whose judgment and zeal they can confide. The system has, upon the whole, worked well in the country districts, and that too in many places in spite of the lukewarmness and parsimony which greatly impede the activity of trustees and sometimes thwart their best directed efforts. Practical, sensible men have generally been found, willing to expend time and thought upon the business of their school, and resolute to obtain for their own children and for those of their neighbors the best education of which their circumstances will allow. And the results, when we consider locality, social condition, and financial circumstances, have been sufficiently gratifying, and encourage to further and redoubled exertion to complete what has been so auspiciously begun.

But in the towns has there been that degree of success which we might reasonably expect? The circumstances under which the work of education proceeds in the towns are more favorable than in the country. Good school accommodation, careful organization, healthful competition, bright and more stimulating surroundings than in the country, greater regularity in attendance, and more liberal support, ought assuredly to be conditions under which higher attainments can be reached than in the most highly favored of our country districts. And yet, if we are to judge from reports, and the observation of competent and independent men, there is still much to be desired in the education provided in our town elementary schools. The work is too mechanical throughout all the grades, the classes are too large, and there is such an eager and anxious anticipation of the period of grading and the public exhibition at the end of the school year, that the true aim of education is lost sight qualities most needed by our school boards were knowledge of men and of the world, prudence, moderation, patience, resoluteness, and business talent. But now when it is generally accepted and its organization complete, other requisities are necessary. There ought to be members on the board who understand educational questions, who will be able to estimate the value of a teacher's work and to distinguish the true teacher from the quack—men of culture and intelligence who alone can comprehend that the highest results in education are unattainable except by the man of scholarship and culture. Some years ago we numbered among our acquaintances a gentleman who was chairman of the school board of an important city in our dominion. He regarded its educational facilities as perfect, and in common with others besides his fellow citizens conscientiously believed that they had achieved the greatest educational success in the land. A friend of ours, a native of that city, who, after leaving it, had studied in Europe and the United States and who was well able to judge, on returning to it after an absence of some years, wrote that its educational buildings were superb, their furniture and appliances excellent, the organization admirable, and the teachers the best that could be obtained in the province—there was only one thing wanting, and that was *education*. The school board of this city felt satisfied with their work and rightly so. They had done all that they were competent to do and they had done it splendidly. What still remained unaccomplished was the most difficult task of all.

This city is, doubtless, not singular as an illustration, many of our readers may know of parallel cases. But after all how is the remedy to be found? Why not avail ourselves to a greater extent than heretofore of the assistance of professional men? Doctors, lawyers, clergymen and others could be found who would be both able and willing to assist in this great work. By education, training and habit, they ought to be qualified, and every member of the community should be disposed to render whatever service he can to advance the welfare of the town in which he resides. Nor is it fair that professional men should adopt a critical attitude towards our schools and those who manage them, and do nothing to remove the evils of which they complain. They ought to be prepared to take their share of public duty and ought to consider it an honor and a privilege to be permitted to take part in a work of such vital importance. And such an admixture of the professional element with the mercantile would, we are confident, be productive of much good. From their position and antecedents, we would be justified in expecting their advocacy of a sound education as distinguished from what is hollow and pretentious, and in judging that they would be less likely to be caught by what is showy and sensational than those who are unaccustomed to read and think on these subjects. And may we not also trust that their influence would be exerted in opposition to the exercise of that false and fatal economy that would, in the selection of a teacher, prefer cheapness to competency?

Should men of education and culture exhibit greater willingness than heretofore to serve in the capacity of school trustees, and should the people manifest a stronger desire to select such men for that important trust, we do not doubt that their influence would soon tell upon the community by the creation of a more rational sentiment in educational affairs, and upon the schools by the communication of such an impulse as shall elevate their moral and intellectual tone.

of. *Teaching* has in many places been supplanted by the *hearing of lessons*, and the introduction of a weekly page or two from a hand-book enables pupils to say that they study some branch of science or literature. The real has, in such cases, been displaced by pretence, and drill and organization, which are means not ends, are regarded as the staple of display on show days. This may be interesting to parents whose children acquit themselves with credit on such occassions, and it may receive the commendation of such persons as see only what is placed under their eyes but are blind to everything else and are incapable of thought, but it is not in this way that young people are prepared for the duties of life. School should be made as agreeable as possible, but, while physical exercises ought not to be neglected, means must be adopted to present lessons and regular class work in general in such a manner as to conciliate the sympathy of the pupil and promote his moral and intellectual advancement.

The remedy rests with school boards and teachers. School boards for the most part consist of men engaged in business. They are selected as representatives of the community, and are supposed to know what is best adapted, in education, to meet the wants of their fellow citizens. As practical men, experienced and successful, they are asked to undertake the direction of those instrumentalities that have for their purpose the training of the intellect, conscience, and physical powers, and we know of few public positions that involve in their duties greater responsibility or require more tact and judgment for their efficient discharge. In the early years of our public school system, when asperities had to be smoothed, bitter opposition overcome, and buildings erected, the

Astronomical Notes.

The Planets for April and May.

In the middle of April all the planets except Jupiter are above our horizon sometime between sunset and midnight, and so too are the four principal planetoids—Ceres, Pallas, Juno and Vesta.

Mercury. Many star-gazers have never seen Mercury. There have been astronomers who never saw him either. Tradition says that Copernicus was one of them and that he lamented the fact on his death-bed. There are books which say that Mercury can't be seen without a telescope. This were strange if true, seeing that he was known ages before there were any telescopes. Of course it is not true. Mercury is sometimes as bright as Jupiter. At such times he fairly forces himself upon your attention and draws from you a "Hello! What's that?" February, 1888, and January, 1889, were times like these. But usually that's not the way you get a sight of Mercury. It's not a case of seeing an unknown bright object and asking "What's that?" but a case of first forming a wish to see the known object and then saying "Go to, let us look for him." And if we know where and when to look and have a clear sky to look into, verily we shall have our reward.

Where to look? For the present suffice it to say that when Mercury is morning star you must look for him in the east and when evening star in the west, in both cases within 20° or so of the point where the sun rises or sets.

But it is only as evening star that I am going to consider him here.

When to look? The Almanac will tell you when he is "in superior conjunction." That is when he is beginning a season of evening star performances. It will also tell you when he is "in inferior conjunction." That is the end of his evening star season. Don't look for him at either of these times. Between these dates you will find another one, that of his "greatest elongation." That is when the apparent distance in the sky between him and the sun is greatest for that season, when he is at the farthest point of his swing on the east side of the sun.

In works on Popular Astronomy the star-gazer is generally recommended to look for Mercury at the times of greatest elongation. Those are the times—or very nearly so—which Newcomb gives in his Section on Mercury. And he says that "the period of visibility extends a week or ten days on each side" of the given dates. In the 'Annuaire Astronomique pour 1890," Flammarion also gives the dates of the greatest elongations, and says, "C'est a ces dates qu'il conviendra de chercher la planete, dans une periode de cinq ou six jours de part et d'autre de ces grandes elongations."

Now let us consider Mercury's present season of evening appearances. It began on April 9th and will end on May 29th. That is a week less than the average, but so much the better. The brilliancy will be greatest on April 19th, the elongation on May 6th. This being the case, it will be better to modify the general rules given by Newcomb and Flammarion. Instead of beginning to look for Mercury "cinq ou six jours" or even "a week or ten days" before greatest elongation you may begin about three weeks before. If the sunset sky is clear and if you look in the right place, you ought to see him in the middle of April or a day or two after. Use your glass of course in looking for him as early as that. Don't expect to see him three weeks or even two weeks *after* greatest elongation. On April 20th he will be above our horizon for one hour after sunset and so he will be on May 20th; but on May 20th he will be only one-sixth as bright as on April 20th. At greatest elongation on May 6th he will be above our horizon for two hours after sunset. Half an hour after sunset on that evening he will be 15° above the horizon, above the W. N. W. of it nearly, a little to the south of were the sun went down. This may be of use to you if you don't happen to see him before May 6th, but you ought to see him long before that.

The latest news about Mercury is that his day and his year are of the same length. Popular Astronomies give his day as 24 hours 5 minutes long. The good ones warn you that this is very uncertain; "quite doubtful, if not entirely void of foundation," says Newcomb. And now Schiaparelli of the Milan Observatory announces that Mercury takes as long to rotate on his axis as he does to revolve in his orbit, that is, his day and his year are equal in length. We have several cases of this kind among the satellites—our own moon is the best known—but it is quite a new experience to find it in a planet. Those interested in the matter and who read German will find an article on it in the February number of of Himmel und Erde.

Venus. In the middle of April last year Venus was within two weeks of the end of her career as evening star for that season. In the middle of April this year she is evening star again and has been so for two months. Then, although a moribund Hesper with only a fortnight of life left, she was bright enough to be seen at noon-day. Now, although she has been playing Hesper again for nearly two months, there are probably many who have not yet seen her. There is nothing strange in this, for she is seventy-seven millions of miles farther from us now then she was then, and not half as bright. Also, although she is now two months past conjunction and was then within only two weeks of it, she has as yet swung out to the east of the sun only two-thirds of the distance she was then from him. But there is plenty of time yet to see her; she will be evening star until December. She deserves and will perhaps get an article all to herself some time between now and then. Meantime you should be observing her increasing brilliancy, her increasing elongation from the Sun, and, later, her motion among the stars. On April 15th she is 14° east of the sun and sets an hour and a quarter after him.

Mars. The last time that Mars could be easily seen in our evening sky was about the middle of last April. He set then an hour and a half after sunset. In the middle of this April he rises about an hour and a half before midnight. He is now 160 millions of miles nearer us than he was then, and more than ten times as bright. Six weeks hence he will be more than twice as bright as he is now. This is one of his good years, and the owners of big telescopes are taking advantage of it to examine those curious "Canals" which Schiaparelli discovered in 1877. The trees along the banks of the Canals were "discovered" by our own Wiggins.

When you look for Mars in the south-east about an hour before midnight you will see *two* red stars. One is brighter than the other and is growing still brighter; one twinkles less than the other; one changes its place among the stars and the other is fixed; one is the true Mars, the other is the Anti-Mars (Antares).

Next month or the month after will be a good time for a special article on Mars.

The Asteroids. Of these *Vesta* was at her best in January but she is still within range of a good field-glass with a patient pair of eyes behind it. She is moving east. On April 20th she will be near Psi Cancri. In June next year you will be able to see her without a glass if your eyes are fairly good.

Ceres, *Pallas* and *Juno* are at their best for this year in April, May and June and may be found and followed with a field glass. They are all moving west at present. On April 20th, Ceres will be in the north of Scorpio near Ksi, Pallas in the north of Serpens near Corona, Juno in Ophiuchus very near 23.

But this is not a good year for Pallas, or Juno, and the Asteroid-seeker had better confine his efforts to Ceres. Her "opposition" falls in the middle of May and she will then be about as bright as a seventh magnitude star.

Find Ksi Scorpii from its position on your map. It is the brightest star in the northern prolongation of Scorpio. South and a little east of it at a distance of 1½° is 11 Scorpii of the sixth magnitude. Directly east of 11 and another 1½° or so off is another small star of about 8 magnitude. Ceres will be under this one in the middle of April. At the end of the month she will be under 11. About May 20th she will be half-way between Ksi Scorpii and Gamma Libræ.

This will be the best chance to see Ceres for several years hence.

Jupiter. Won't be visible before midnight until near the end of May.

Saturn. Saturn is now on the west side of Regulus. He was due north of the Star at the end of March, and only ½° distant. He will continue moving west until the end of April, and will be again due north of Regulus at the end of May. The ring is now at its widest for this year. This is less than half the width it showed three years ago, but it is more than double what it will show next year. The largest Satellite, Titan, may often be picked up in a small telescope if looked for at the right times. These times for the next month will be on the following dates and for a day or two on each side of them:—April 13, 21, 29, May 7, 15. On the second and fourth of these Titan will be out on the east side of Saturn, on the others he will be on the west side. Note that it is easy to cheat yourself into thinking that you have seen Titan, when you have only seen a small star that Saturn happens to be near at the time. People often make the same mistake about Jupiter's moons.

Uranus. Uranus is now at his best for the year. On April 14th he will be on the meridian at true midnight. If you have heard or read that he can't be seen without a telescope, don't believe it—at least not until you have given your own eyes a fair chance.

First, look at Spica, the brightest star in the south-east at 9 o'clock in the middle of April. To the left of Spica you will see (use your glass if necessary) three small stars nearly in line with each other and with Spica. That's how they will look—a few days after the middle of April. The outermost of the three little fellows is—but it will be better to put it this way—two of them are stars (h and m Virginis, m may be 82 on your map), the other is Uranus. As you watch them from night to night after April 20th you will find Uranus moving slowly off the line. He will move in the same direction until the end of June and will then begin to move back, but he won't get back to that line again until it is too late in the season to see him.

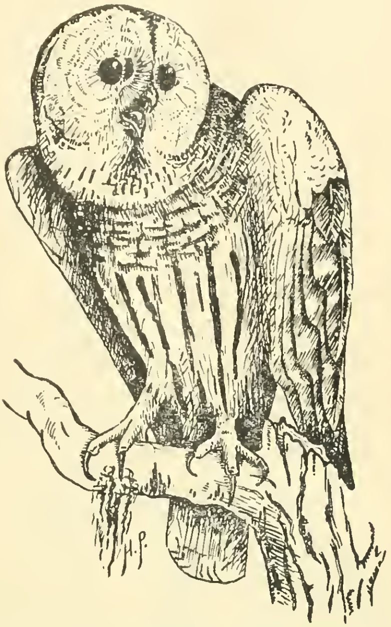
Neptune is still up in the early evening but you had better postpone further study of him until October.

A. Cameron.

Yarmouth, N. S.

FERNDALE SCHOOL.

No. XXIX—Birds of Prey.



Barred Owl *Syrnium nebulosum.* (Forst.) 368 A. O. U.
[Shot near Bedford, Halifax, Oct. 17th, 1889. Total length from end of bill to end of tail feathers (measured before skinning) = 19¼ inches.]

Nightly sings the staring owl,
To-who;
Tu-whit, to-who, a merry note.

—Shakspeare—*Love's Labor's Lost.* Act. V. Sc. 2.

O thou precious owl!
The wise Minerva's only fowl.

—Sir Philip Sidney—*A Remedy for Love.*

Teacher. Here we have our Barred Owl in fine light plumage and with a very light ruff around its neck. Let me ask you some review questions on it. Does it belong to the Order *Steganopodes*?

S. No. Its toes are not full webbed.

T. Is it one of the *Tubinares*—the Order *Tube-nosed* birds?

S. No. Its nostrils are not a pair of tubes.

T. First, the web; second the nostrils; now thirdly, I ask you to examine the cutting edges of its bill. Is the cutting edge fringed or toothed, or not?

S. It is not. It therefore does not belong to the Order *Anseres*—the *lamel billed birds*.

T. Fourthly. Are the legs situated in the usual position, or towards the extreme end of the body as in the *Pygopodes*?

S. Usual position. It is not one of the rump-footed birds.

T. Fifthly. Are the front toes more or less webbed?

S. No. Therefore it is not one of the *long-wings*—the *Longipennes*.

T. Sixthly. Is the lower part of the shank naked or feathered?

S. Feathered. Therefore it is not one of the *Wading* Birds.

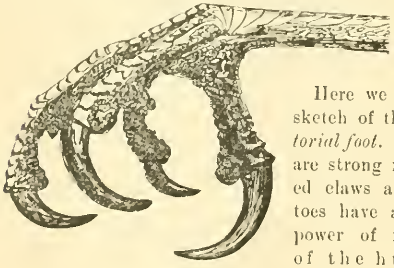
T. Seventhly. Is the bill *strongly* hooked or not?

S. Strongly. It is a bird of prey—one of the *Raptores*.

T. Or a Parrot?

S. No.

T. I might say, eighthly, that birds of prey have generally *three* toes in front and *one* behind; or *two* toes in front always, and the *third* one reversible, that is capable of grasping in front or of grasping from behind like the *fourth* toe. In parrots the toes are *two* in front and the other *two* permanently behind.



RAPTORIAL FOOT OF A HAWK.

Here we have a sketch of the *raptorial foot*. There are strong recurved claws and the toes have all the power of motion of the human fingers making it a perfect clutching apparatus.

Do you remember the order of the eight points to which I called your attention.

S. Yes. 1st. Full web or not. 2nd. Tube nostrils or not. 3rd. Lamel-bills or not. 4th. Position of legs. 5th. Webbed-toes or not. 6th. Shanks naked or feathered. 7th. Bill strongly hooked or not. 8th. Their toes capable of grasping in front.

T. Very good. That will be found to be a very convenient order to proceed with the preliminary examination of a bird.

But the order *Raptores*, contains *four* families. First family the American Vultures, which have their heads generally naked.

S. It is not of the Vulture family then.

T. The second family have their eyes lateral, *i. e.*, on the sides of their head and not circled with a disk of radiating feathers—the Hawks.

S. It is not a hawk, then?

T. The third and fourth families are the Barn Owls, and the Common Owls. The Barn Owls differ from the others by having the inner toe as long as the middle; the inner edge of the middle claw pectinated; the feathers on the hinder part of the shank pointed upwards, etc.

S. Our specimen is one of the Common Owls then, as the inner toe is decidedly shorter, the inner edge of the middle claw is not comb-toothed; and all the feathers of the shank point downwards. But what are the names of the birds in each of these four families?

T. *Vulture* family. 1. Turkey Vulture. 2. Black Vulture, occasionally visiting New Brunswick from the United States.

S. *Hawk* family?

T. Common: 3. Marsh Hawk; 4. Sharp-Skinned Hawk; 5. American Goshawk; 6. Red-tailed Hawk; 7. Bald Eagle; 8. Pigeon Hawk; 9. American Sparrow Hawk; 10. American Osprey. Rare: 11. Broad-winged Hawk; 12. American Rough-legged Hawk; 13. Golden Eagle; 14. White Gyrfalcon; 15. Duck Hawk, reported as seen in New Brunswick. 16. Cooper's Hawk; 17. Red-shouldered Hawk.

S. *Barn-Owl* family?

T. None. The American Barn Owl has not been observed in these provinces. But if you should happen to take a specimen you would be able to recognize it as different from our Owls. Our Owls may be divided into *two* sub-families. The *greater*, whose wings are above *ten* inches in length; the *smaller*, whose wings are less.

S. If our Barred Owl is 19¼ inches long its wings must be over 10 inches, and therefore it must be one of the greater Owls.

T. Correct. We have *six greater* Owls and *four lesser* Owls.

S. Can we have their names?

T. Certainly. The most common Greater Owls are: 18, the Barred Owl, and 19, the Great Horned Owl; not so common: 20, American Long Eared Owl; 21, American Short Eared Owl; 22, Snowy Owl, observed in New Brunswick only; 23, Great Grey Owl. The Lesser Owls are; 24, Richardson's Owl; 25 Saw-whet Owl; 26, American Hawk Owl, observed in New Brunswick only; 27, Screech Owl.

S. Why is our specimen called the Barred Owl?

T. You notice the broad lines or bars of darker and lighter browns or whites on its plumage.

S. What do they live on?

T. Any small animals, birds, chickens or insects they can capture. Their large eyes give them special advantage over many birds during the night.

S. Are they larger or smaller than our specimen, generally?

T. Larger, rather, 20 to 24 inches long; wings from 13 to 14 inches.

S. Where do they nest?

T. In trees—hollow trees often. The eggs of owls are white and oval. The eggs of the Barred Owl are two or three, nearly two inches long and over one and a half inches wide.

[For the REVIEW.

On Collecting, Preserving and Studying Marine Invertebrate Animals.

BY W. F. GANONG.

> *Immensa et summe admirabilis Dei potentia atque solertia in rebus cœlestibus, iisque in aëre et terra fiunt, maxime vero in mari, in quo tam variæ et stupendæ rerum formæ conspiciuntur, ut quærendi et contemplandi nullus unquam futurus sit finis*—RONDELETIUS.
>
> Quoted in Forbes' History of British Starfishes.*

INTRODUCTORY.

Very few persons, aside from the professional naturalists, have any conception of the abundance of life in the sea. The average student if asked how many different kinds of flowering plants there are in a particular region, for instance New Brunswick, can give very probably an answer which is somewhere near the truth. So as to the Mammals, and the Birds, and the Reptiles, and perhaps even the Insects, he can give an intelligent answer when asked their number. But how many know that the waters that bathe the shores of Acadia, relatively barren as they may seem, contain more distinct species of animals than all of the species of Mammals, Birds, Reptiles and flowering plants of Acadia combined, and that this is still true if we exclude from our marine fauna, all the fishes, and confine ourselves to the Invertebrata alone? The sea presents a field for both professional and amateur naturalists, which is as broad as the land, and from having been worked much less, offers far more problems requiring immediate solution.

By the Invertebrates of the sea, we mean (as it is hardly necessary to mention to the readers of the REVIEW), all of those divers forms to which we are going to introduce our readers, which are not Fishes nor Mammals, or in other words, all those which have no backbone. They all fall into groups† as follows:

PROTOZOA. These are animals, some of which are the simplest organisms it is possible to imagine, jelly-like, very minute; only the largest of them have any definite organs for taking food or for locomotion, and even these are of a very simple sort. Many secrete lime or flint shells of perfect symmetry and great beauty and these are easily preserved. There must be at least some two or three hundred forms in our waters; probably there are many more.

SPONGES. These may be compared with great colonies of Protozoa, in which each individual is very simple and fixed in its place, but the colonial system, with its division of labor, nearly perfect. There is an elaborate system of water passages to carry food and oxygen even to the innermost parts of the colony, and another to carry off waste matters. For supporting the colony and to keep the passages open, a skeleton is built up, which is sometimes of horn-like texture, as in all the commercial sponges; sometimes of flint as in the exquisite Venus' Flower-Basket, sometimes of chalk as in some of the forms of our own shores. We must have in all at least forty species. They live in all situations, and are always fixed to the bottom when adult.

CŒLENTERATES. Animals that have the body hollowed out so that they resemble a thick-walled bag or sac, the whole interior cavity of which acts as a stomach. Projections called "tentacles" for taking food are usually present. In some the mouth of the sac is somewhat infolded and joined to the outer walls by vertical partitions. These are the always minute coral animals (so often wrongly called "Insects") and the "Sea-anemones," which grow to two or three inches in diameter. Of the former we have none in our waters; of the latter we have some thirty species of various sizes and colors, all of which can creep slowly about. Some of the Cœlenterates, on the other hand, have not the infolding of the mouth. These have various sorts of tentacles and various methods of locomotion, and are often collected into colonies which very closely resemble delicate plants. These are the Hydrozoa or Jelly-fishes, some of which attain a size of two feet or even more in diameter. This is one of the most interesting and, in our waters, one of the least studied groups of Invetebrates. We must have at least one hundred and fifty species, living in all sorts of situations.

ECHINODERMS. In this group (which to many persons is the most attractive of all), the animals have a radial arrangement, there being nearly always five equal parts arranged around a centre. The familiar Starfish is a good example. The nervous, digestive and circulatory systems all share in the radial arrangement. They are the first to have a definite digestive canal. The colors are frequently very bright and varied, and all have more or less lime in the skin. The lowest forms (Crinoids) are plant-like, stalked, and of great beauty. The Ophiurans or Snake-stars, have five snake-like arms radiating from a disc. Starfishes with their five rays and small discs, all have seen. Sea-urchins have a shell, hightly sculptured. Holothurians are soft-bodied, with the lime reduced to symmetrical plates and wheels. We have in all about forty species, living for the most part in clear water.

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* I ask the pardon of my readers who are not learned in Latin. So true and so appropriate to our subject are these sonorous words, and withal so beautifully fitting is their sentiment, that I am sure some at least of my readers will share the pleasure I have in them. Rondeletius, or to un-latinize it, Rondelet, was a French naturalist of the early part of the sixteenth century who wrote much on fishes and did great service to the science of Ichthyology. The book in which the sentence is quoted is a classic which is at once our admiration and our despair.

† For these brief and superficial descriptions, the writer must ask the kindly indulgence of his Zoological readers. It is not for those learned in Anatomy they are written, but for the beginner, who should always have the most evident characters presented to him first, in order that he may follow the logical plan of proceeding from the known to the unknown. The classification is not the latest, but the most convenient.

Worms. A great group including some forms very unlike the animals we associate with this word. The animals consist of a series of rings (the common angle worm may be taken as a type), jointed together, with a nervous system along the under side, a blood system on the upper side and the digestive system between. They have definite right and left sides, and head and tail ends. Some are very soft-bodied, showing no external trace of the rings, others live in shelly tubes; some swim about freely, others are parasites and live upon industrious hosts. Some grow to be two or three or even more feet in length; others are very minute. So altogether they form a motley company, many of them appearing to be ashamed of their relationship and anxious to conceal it. They live in all sorts of situations from mud to clear water, and must number in our waters nearly two hundred species.

Crustacea. Animals made of a series of about twenty rings or joints, hardened on the outside, some of which are usually firmly united together. These rings bear appendages which are jointed and serve as organs of locomotion, for taking and crushing food, etc. Lobsters and Crabs are examples. Nervous, blood and digestive systems are as in the Worms. They breathe usually by gills which are attached to the legs and protected under the shell of the back. They occupy all situations and the great majority can swim or walk about, though some, as the Barnacles, are fixed to rocks when adult. We have at least 250 species in Acadian waters. Some of the lower forms are very minute.

Molluscoidea. A group including forms of greater variety than even the worms. Nearly all are attached to some support when adult, though the young of all can swim about, as indeed can the young of nearly all marine animals. There are three divisions of the group. The Bryozoa or Moss-animals, or Polyoza as they are variously called, are very small, but in colonies, some of which form very prettily sculptured and colored brittle films on stones or shells, while others look like small corals, while still others bear a resemblance to plants. Each animal occupies its own little cell and has a wreath of tentacles for breathing and taking food. We must have more than sixty species. The Brachiopods are very like ordinary bivalve Molluscs in appearance, but, besides being attached by a stalk have the shell on the front and back instead of right and left, and each has a pair of very long coiled but extensible arms for breathing and taking food. We have only two or three species. The Tunicates, or Sac-molluscs, or Ascidians, are for the most part fixed when adult, having a soft sac-like body with two small openings, one for taking in food and oxygen to the internal breathing cavity, and the other for the emission of waste matters. They grow to be two or three inches in diameter and are often brightly colored. They have great interest for the naturalist for the reason that they are believed to be more nearly related to Vertebrates than any other Invertebrates, but this is not much for us to be proud of. We have about thirty species.

Mollusca. This is probably the group that is studied more than any other of our Invertebrates and is the best known to the readers of this paper, for is it not here that the Oyster occurs? They fall naturally into three groups. In the Bivalves (Oyster, Clam, etc.,) there is a valve on the right and another on the left side. They have large flat gills, a mouth, without a head, concealed near one end, and often tubes for bringing in fresh and removing used water. In the Gasteropods (as the Whelks and Snails) the single shell is spirally coiled and the animal can withdraw into it and close the opening by a lid. They have a distinct head and a large muscular creeping disk. The Cephalopods (the Squids are examples) have a distinct head with eight or ten arms bearing suckers arranged around it, and are highly organized as to their nervous and circulatory systems. Many can swim with great rapidity. Of Mollusca we have in all over 200 species, living in all situations.

These then, are the inhabitants of the sea, How can we capture them? How can we perserve them? And how profitably can we study them? These questions we will try in a measure to answer in the three following numbers of the Review.

Harvard University,
Cambridge, Mass., March 31st.

McGill University has lately been enriched by a donation of $200,000 from W. C. McDonald, of Montreal, three-fourths of which goes to the Law Faculty and one-fourth to the department of Experimental Physics. With this princely gift McGill will increase its usefulness in these departments. What private benefactor is just now thinking of making a gift to any of our Atlantic Provinces Colleges? He would do himself honor, and if others would follow his example, who can estimate the benefits to future students that would follow?

For the REVIEW.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

FIFTH PAPER.

The teacher will do much to secure progress by taking five minutes forenoon and afternoon for singing, and he will also help on the other work of the school. In the short bi-weekly lesson of twenty or thirty minutes revise the former work, and try always to introduce some new point and thus keep up the interest in the lessons. In every lesson use the modulator and the manual signs.

The manual signs thus far are,—firm DOH, the hand closed, back up; rousing RAY, simply open the hand, raising the points of the fingers a little above the wrist; calm ME, raise the wrist to bring the hand to the level, palm down; SOH, turn the hand on its side little finger down; the piercing expectant TE wishing to go to DOH, the hand all closed except the index finger, pointing upwards. Remember to give a few ear exercises each lesson. After the following elementary rhythms have been mastered they can be used at the beginning of a lesson as tuning exercises. In teaching them first go over the time names, then sing each measure separately to one syllable, next take the whole exercise still using the one syllable, and after this has been done satisfactorily sing the exercise to the notes.

No. 2. Key F. *Bugle Call "Close."*

{:m | d:s_1.m | d.d:s_1,m | d:s_1.m | d,d:s_1.m | d:— | m‖

No. 3. Key A. *Bugle Call "Fatigue."*

{:s_1 | d:m.s_1 | d:m.s_1 | d.s_1:m.s_1 | d.s_1:m.s_1 | d:m.s_1 | d
{:m.s_1 | d.s_1:m.s_1 | d‖

No. 4. Key F. *Bugle Call "Guard."*

{| s.m:d.s_1 | d.m:s_1 | s.m:d.s_1 | d:— | s.m:d.s_1 | d.m:s_1
{| s.m:d.s_1 | d:—‖

No. 5. Key A. *Bugle Call "Advance."*

{:s_1 | d.d:d.s_1 | d.d:d.s_1 | d,s_1:d.s_1 | d.d:d | s_1:— | s_1:—
| s_1:— | —‖

These are in four pulse measure. If we bind two measures of two pulse measure together, and make the second strong accent, somewhat weaker,—a medium accent, we have, four pulse measure in its primary form. This measure is a little more delicate and elegant than two pulse measure. In four pulse measure, primary form, the accents are strong, weak, medium, weak, as in No. 4. We have the secondary form of four pulse measure in No. 2, No. 3, and No. 5, where the exercise begins with the third pulse, which has weak accent. The accents then are weak, strong, weak, medium. Beat four pulse measure, down, left, right, up. When any of these exercises have been mastered in time and tune it may be used for teaching the mechanical part of expression. Thus, sing over the exercise very slowly, then quickly, then at a medium rate. Next sing over the exercise very softly, at a medium rate, then strong. Tell the pupils the signs *f* for forte, meaning strong, *p* for piano meaning soft. Again sing over the exercise beginning very softly, and gradually increase the force towards the end. Write over the beginning *p.* over the middle, *m,* for medium strong and *f,* over the end. Reverse this, beginning strong and ending very softly. In this way a great deal of teaching may be got out of one of these simple exercises. Time ear exercises may also be given. Let the teacher sing such simple exercises as the following, beating the time, and then the pupils taattai.

| d:d | d:—‖   :d | d:d | d‖ | d:— | d:d | d:—‖
| d:d.d | d:—‖ | d:—:d | d:d:—‖ | d:d.d:d‖

Next the teacher may introduce different tones. Give the class simple rounds and exercises, embracing the tones of the two chords taught D. and S.; but with rounds do not sing them as such until the class has reached the next step. J. A.

For the REVIEW.]

Clay Modelling.

As the new school term is approaching and as many of our primary teachers will, no doubt, then be beginning clay modelling, a few words as to the way in which we take it up in kindergarten may not be amiss.

Some excellent suggestions and lessons appeared in the REVIEW last fall, but I think no one spoke of giving the child an idea of the *history* of the clay before beginning to work with it.

In kindergarten we endeavor to bring before the children the history of all the different materials, as they are from time to time presented to them, thus really beginning the study of *history.* We find that this has a wonderful fascination for the children, and it is, I think, one secret of the great interest they take in using the kindergarten materials. They like us to "build bridges between us and the past."

For instance, the woollen ball is traced back to the wool on the sheep's back, and is carried through all the stages of shearing, washing, picking, rolling, dyeing, etc.; the wooden blocks are traced back to long ago when a little seed fell from a tree; and a fanciful story is told of the wind covering it with the brown earth, and the refreshing showers and the beautiful sunshine all kindly aiding in its growth. The story of the branches and leaves growing year by year is told, until at last, when the tree has become large and strong, a woodman finds it, and seeing that it is good for kindergarten blocks cuts it down. Then the history of the process it goes through at the mill is dwelt upon, and the result is that the children not only feel a deep interest in the little block, but they have a "bridge" over which they can run at will, and in so doing they become "loving and observant students of nature."

The steel rings, too, have a wonderful story to tell, but most marvellous of all is the clay. It takes us, to be sure, into the study of geology, and the "bridge" extends a long way back, but we must make it to suit the little feet that will travel over it. We tell some such story as this:

A long, long time ago, before there were any children living on the great round world, before there were any birds, or trees, or grass, or flowers, or mosses, the round world was a strange looking place. There was nothing but big oceans and rivers and great rough mountains of rock (show a piece of igneous rock—granite, for instance). Well, Jack Frost used to come around in the winter, just as he does now, and he would crack and crack the rocks making such terrible noises, and he would knock off large pieces of rock and down they would fall. Then sometimes the great round world would shake (describe simply an earthquake) and some more pieces would be thrown down, and would sometimes be "tossed in the air as if a giant were playing with them;" and there were terrible winds, and these great large pieces of rock and little pieces, too, were tossed and pushed and dashed and knocked against one another (suit the action to the word, knocking two pieces of granite together, so that they will see the result) and great pieces and small were knocked off. Then between the wind and the shaking world these pieces of rock were pushed about and rolled down mountains and carried through swift running rivers, until they were ground to powder, finer than flour, (show some clay ground up). This powdered clay was carried along by the rivers of water (now show glass of water with clay well mixed up in it) until at last the river came to a quiet place (if you hold the glass very quietly for a few moments they will see the sediment forming in the bottom, and if their imagination has been developed you can lead them to feel that it is going to sleep) and the powdered clay lay down in that quiet place and went to sleep. Oh! what a long, long quiet sleep it had! It lay there for hundreds and thousands of years in its dark, cool beds, until one bright morning it came slowly up into the beautiful sunshine, and there it lay on top of the round world, until one day (this is the way we finish our story in Dartmouth) Mr. Condon, our Principal, went out for a walk, and seeing it, picked up some, and finding it good for modelling got some of it for the little children to use in kindergarten.

If the story is told in some such way as this the children will not only be interested in the clay, but they will work more intelligently with it. They will readily notice the mica and compare it with that in the granite. A foundation will be laid for the study of geology and their minds will be opened up so that they can begin to read "whole chapters of the great earth's history."

MARY A. HAMILTON.

For the REVIEW.]

How to Learn a Language.*

There is a great deal said about *how* to learn languages. There is too much said, many will add; instead of talking, go and learn the language you want; there is no royal easy road. And as Joseph de Maistre said of Latin and Greek, we have learnt these languages by a hard method, and you who are talking about simplified methods, you do not yourselves know these languages.

Still there is some use in talking about the *how*, and in trying to make the hard method easier, if not easy. Why is there? Because boys and girls, men and women, are what they are; and they may be half unknown to themselves wheedled not into a knowledge of the language, but into taking the trouble necessary for knowing it. For let us all confess that no language can be learnt with ease. It takes a life-time to learn one language, as Ruskin says. 'Picking up' a language is picking up rubbish.

It is well known, however, that many have been interested at first in a language, either by going to a country where it is spoken, or by roughly getting the sense of books necessary for a particular or technical study, or by conversation even about the most trivial matters. The people thus interested would otherwise not have learnt the language. Why not try thus at first to interest them?

The authors of this *Conversation Method in German* seemed to have asked themselves this question—as have many other teachers by the natural method. Some others, however, forgetting that a mother tongue is learnt 'naturally' by children, while the new tongue is to be learnt naturally by adults, have refused to give explanations, and refused to teach grammar. This is a new pedantry. Messrs. Bober and McKay try to teach German orally, and at the same time to explain gradually grammar and construction. With the help of a good and eager teacher their book ought to be very useful.

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*The Conversation Method in German. Part I. By Hans Lothar Bober and A. McKay (1890) T. C. Allen & Co., Halifax, N. S.

Names of objects are taught first, then simple questions about these, together with the forms of possessive and demonstrative pronouns or adjectives, of the comparison of adjectives, and of the most used parts of some verbs. It will be borne in mind that to teach conversation is the first object of the writers. Therefore they make things easier for pupils by not teaching more grammar than is thought necessary to understand sensibly the gradually taught conversation. They leave more with the teacher; he must indeed have energy, patience, brightness, and good temper. Certainly the teacher ought not to hurry; he ought to go over and over the first lessons, and be quite sure that all understand; it will be no use going on further in conversation if there remain some who feel confused. The class of course ought to be small.

This book comes specially recommended to many persons in several towns in the Maritime Provinces, where Herr Bober has been for some time known as a most painstaking teacher, who has, too, what are so necessary in teaching to speak a language, a clear voice and a distinct pronunciation, not to speak of the interest he gives his pupils by his enthusiasm for what is so closely connected with their study—his own great country, its position in the modern world, and its artists and thinkers belonging not to Germany alone but to us all, who by them are made to realize the common human brotherhood, and to look for our full escape from what one of them calls "that slough of national egotism."

Does not that give you a good reason for learning another language? W. F. Stockley.

Fredericton, N. B.

For the Review.]

The German School.

If the readers of the Review will lay aside the study of plants, minerals, insects and stars for a short time, we will take a peep at the German school with them.

The school-houses are similar, therefore if we see one we have a good idea of all. Let us visit one. The school-building occasionally fronts on the street, but as a rule they are in the interior of a block and are connected with the street by a gateway. They are built of brick, and indicate at once that they are for use and not for ornament. The outline is regular and prosaic, and the general expression of the whole is that of solidity and massiveness rather than elegance. They are usually four storeys high and contain from twelve to twenty-four classrooms. In the upper storey is a large hall, in which sewing, music, and the festivities in connection with the school take place. In connection with each is a play-ground, varying in size from one-quarter of an acre to two acres. The school rooms and premises are plain, clean and neat.

There is no school apparatus in the class-rooms, except one small blackboard, three by six feet, on the wall back of the teacher. One of the characteristics of the German school is thoroughness. The teacher who will politely admit us to his class-room is a servant of the State, and when he becomes unfit to teach, receives a pension from the government for life. In order to become a teacher it is necessary to take a preparatory course of study for three years, in addition to a course of three years in a normal school, after which a searching examination must be passed. A knowledge of psychology and pedagogics is considered as necessary for the teacher, as law is for the lawyer or medicine is for the physician. With this knowledge the teacher is enabled to proceed intelligently step by step in his work with a definite and clear purpose in view.

A lesson recently taught to a class in a "Seminar" will help us to an explanation. The subject was "Thinking and Memory." These activities were first discussed by the teacher and class from the standpoint of their personal consciousness. Second, Can they be strengthened? If so, when? and how? Third, Should one be exercised and then the other? or should they be developed contemporaneously? Fourth, By what means can the best results be obtained? The exercise was not bookish nor metaphysical, nor was there any attempt to cover a lack of knowledge by a definition.

Every child in Berlin six years of age must attend school according to law, and the law is implicitly obeyed. Physical education receives especial attention in the schools. Every pupil, male and female, receives two hours each week in systematic physical training, under the direction of a special teacher. Attached to each school is a "turnen halle," in which is found all the modern appliances for gymnastic exercises.

The educational report of the city for 1888 states: "that not only the bodies but also the minds, morals and manners of the children have improved under strict physical discipline." The German method of teaching language is worthy of commendation and imitation. There is comparatively little attention paid to the text-book. But from the time the child enters school there is the most careful and painstaking care paid to the proper use of language. Every mispronounced word is corrected, every sentence incorrectly formed receives immediate attention. As soon as the child is old enough, it learns selections from the best authors and recites them, as an exercise in language. In fact every school exercise is a language lesson and no error is passed without being corrected. One of the most noted educationists of Europe, when visiting the Berlin schools, is said to have made the following statement which in the main expresses the truth: "On the whole, Berlin has a system of public schools of which she may be proud, and is proud, too. I have left every building with a quiet jealousy, not on account of the splendid rooms, but on account of the thorough and peaceful work of civilization which is accomplished in them." But I hear you call a halt and I obey. J. B. H.

Berlin, March, 1890.

Foreign Exchange Table.

Our teachers should take care to correct the tables of commercial values of foreign coins given in their text books. Some of these tables are from ten to twenty years old and are positively misleading at present. Many foreign coins change from year to year. During 1889 the following coins appreciably changed: Florin of Austria, silver dollar of Bolivia, Colombia, Ecuador, Peru, and the Central American States, Bolivar of Venezuela, rupee of India, silver yen (or dollar) of Japan, dollar (or peso) of Mexico, rouble of Russia, mahhub of Tripoli.

Canada and the United States having the same par of exchange with Great Britain will practically for the time being have the same par of exchange with foreign countries. For 1890, the present year, the Director of the United States Mint estimated, and the Secretary of the Treasury proclaimed, the values of the standard coins of the nations of the world, to be followed in determining the values of all foreign merchandise imported after January 1, 1890, as exhibited in the following table. By comparing this table with the tables in the "Arithmetic", we will notice: 1st, The great change in the values of foreign coins since the compilation of the "Arithmetic": 2nd The changes of many names and even coins during the same period; Belgium, Switzerland, Spain, Italy and Greece have assimilated their monetary units in value to that of France. In South America there is a group of states which have adopted a common unit, although as in Europe, they may not have adopted a common name, namely Bolivia, Central America, Colombia, Ecuador, and Peru.

Country.	*Monetary Unit.*	*Gold Value.*
Argentine Republic	Peso	$0 96.5
Austria Hungary	Florin	.34.5
Belgium	Franc	.19.3
Bolivia	Boliviana	69 8
Brazil	Milreis	.54·6
Canada	Dollar	1 00
Central American States	Peso	.69.8
Chili	Peso	.91.2
China	Tael, Shanghai	1.03.1
	Tael, Kaikwan (customs)	1.14.8
Colombia	Peso	.69.8
Cuba	Peso	.92.6
Denmark	Crown	.26.8
Ecuador	Sucre	69 8
Egypt	Lb. 100 piasters	4.94 3
France	Franc	.19.3
German Empire	Mark	.23.8
Great Britain	Pound ster	4.86.6½
Greece	Drachma	.19.3
Hayti	Gourde	.96 5
India	Rupee	.33.2
Italy	Lira	.19.3
Japan	Yen, gold	.99.7
	Yen, silver	.75 2
Liberia	Dollar	1.00
Mexico	Dollar	.75.8
Netherlands	Florin	.40.2
Newfoundland	Dollar	1.01.4
Norway	Crown	.26.8
Peru	Sol	.69 8
Portugal	Milreis	1 08
Russia	Rouble	55 8
Spain	Peseta	.19.3
Sweden	Crown	26 8
Switzerland	Franc	19 3
Tripoli	Mahhub of 20 piastres	.62 9
Turkey	Piastre	.04 4
United States of America	Dollar	1 00
Venezuela	Bolivar	14

If this table is put on the blackboard in the schoolroom each pupil should be required to copy it neatly on a piece of paper of the size of a page of the "Arithmetic," and insert it following the obsolete tables.

Professional Training.

We visited a training school in the East recently in which a class of very bright and well-educated young women, some of whom had been teachers, and all of whom had graduated from high schools or academies, were being trained in methods of teaching. The teacher of the class was a lady of culture and of unusual teaching ability, and of unquestionable devotion. Both the teacher and the class were capable. The recitation hour was devoted to the following topic:

The class were to assume that the children they were teaching in their schools had learned all the numbers from one to ten inclusive, by the combination and separation of objects into groups. They were also to assume that the children had learned all the *figures* for these numbers to 6. The question was, "What would be your method of teaching these children the *figure* six?" The entire recitation hour was devoted to the answering of this question, the students writing their answers, which were handed to the teacher when completed. When the papers were all in the class was dismissed. Some of these answers covered a page and a half of "letter paper." They consisted, for the most part. (1) of statements of questions they would ask the pupils about the numbers and figures below six, to be sure that they were ready for this new knowledge; (2) of an examination of their knowledge of the *number* six; (3) testing their knowledge of the written and printed word "six"; (4) asking them if they would not like to know some way of denoting *six* except by the word; (5) making the figure and having them imitate; (6) drilling them upon the use of the figure in expressing the number in several groups of different objects, each containing six.

The teacher's criticism of these papers probably occurred at the next recitation, which we could not attend. Here was the idea of definiteness and successive steps, evidently; and from the point of view of teacher and class the question was generally well answered.

But was not the point of view badly chosen? Is it not bad teaching to give these young teachers the idea that so elaborate a process as the one described is necessary to teach a child the *figure* "6," when it already knows all the numbers to *ten*, and all the figures for numbers below *six?* Is it not magnifying too much the "mint, anise and cummin" of teaching to the neglect of more important matters? Or, perhaps better, is it not giving to young teachers a false notion of thoroughness? Is the method of teaching the digit "6," under the circumstances given, or under any circumstances, of sufficient importance to consume two recitation hours in learning it and one in teaching the figure to children, *provided* the teacher has a due appreciation of the necessity of making the pupils always associate the *figure* with the *number*?

Rote teaching is abominable for the reason that the symbols used are without meaning to the learner. In fact they are not *symbols*, but are treated as if they were the things themselves.

But is there not danger that in trying to avoid this Scylla we fall into the error of forgetting that the essential thing is that the figure or word shall carry with it its meaning, by the emphasis we put upon the *method* of securing this result? Is not the study of this infinite detail of *method* a use of energy that might be used upon weightier things belonging to method; and does it not tend to narrow the range of vision of the young teachers? There is much in the details of method that may be left to the teacher, provided he sees clearly the thing to be done. The effectiveness of a method lies in its spontaneity. Is it not such normal school teaching as we have described that brings the study of methods into unmerited contempt with many plain matter-of-fact people?—*The Public-School Journal.*

EDUCATIONAL OPINION.

A system of daily markings at the close of each school exercise may suit teachers who hear lessons without teaching them, but if the intellectual life of the school is to be awakened and fostered, the teacher must not be hampered by the imposition of mechanical devices. Mechanical perfection in a school is intellectual torpor, and a merit book I can regard in no other light than a letter that killeth.—*Superintendent Crocket, N. B.*

One or other of two things is inevitable, and inevitable by a natural law, if our secondary education is to remain as it is. The common school must deteriorate or the university must be lowered to a secondary school. The efficiency of a common school cannot be maintained unless it is brought into sympathetic touch with something higher than itself. The grammar schools, as organized, do not meet this want. The gap between the common school and the university is too great to admit of a direct uplifting influence. It cannot stimulate the common school by drawing it up into touch with itself, but the common school, like the heavier mass, must by the sheer weight of its members, drag the university down. If the province is not prepared to sacrifice the one or the other of these interests, and I am sure it is not, I see no way of preserving them than by supplying the gap that will unify, and bring into organic relation all the parts of our educational system.—*Supt. Crocket, N. B.*

As the great value of this kind of training (science of common things) is every year more clearly manifested, it becomes necessary for teachers to qualify for science teaching, otherwise they cannot keep abreast of the times and maintain their standing. It may be objected by some that holidays are required for needful rest and recreation. Extended experience, however, proves that change of environment, the intercourse of congenial companions and the pleasing mental stimulus of new ideas, are more pleasing agencies than ignoble rest. Summer schools, originated by the grand and good Agassiz, are every year becoming more popular and useful.—*Supervisor McKay, Halifax.*

The right spirit in a class is nearly everything. The method of instruction may be poor, and there may be many things about the order and gradation that are imperfect, and yet if the teacher has the power to arouse in the pupils a spirit of inquiry, and a desire to learn what it is necessary for him to know, the pupils will make advancement and the result of the school will be good. But without the right spirit, it is impossible to make a *good* school, however well it may appear to the visitor who cannot see below the surface.

PERSONAL.

Professor MacMechan, of the University of Dalhousie, gave an able and interesting lecture in Halifax, on the life and work of his predecessor, the late Professor James DeMill.

Miss Josie C. Upham, for several years head teacher in the Willow street schools, Truro, has been elected to a scholarship in Wellesly College, Mass. Miss Upham is to be congratulated upon this honor, as out of several hundred applicants only a limited number are annually chosen.

Smith Walker, B. A. (Acadia), and George Campbell, B. A. (Dal.), both of Truro, have recently graduated in medicine at the University of New York.

D. A. Murray, B. A. (Dal.), and former tutor of Dalhousie College has been appointed Assistant Professor of Mathematics in the University of New York.

Dr. Wesley Mills, whose book we reviewed in March, has been elected to the Royal Society of Canada, biological section.

Professor Roberts, of Windsor, has also been elected to the vacancy in the literary section of the Royal Society.

H. H. MacIntosh, Esq., Principal of the Lunenburg Academy, has been appointed to the Inspectorship of District No. 2, consisting of the counties of Lunenburg and Queens, N. S.

Hon. D. C. Fraser, B. A., (Dal.), C. H. Munro, M. D., William Cameron, B. A., (Dal.), and Jessrey McCall, representatives of Pictou County in the Provincial Assembly, entertained the students attending the University of Dalheusie from Pictou, at the Halifax Hotel last month. Over sixty guests were present. Among those present who took part in the speech making were His Lordship, Chief Justice MacDonald, Premier Fielding, Dr. MacKay, leader of the Provincial Opposition, Hector McInnes, LL.B., Stewart, of the *Herald*, Thompson, of the *Chronicle*, Howard Murray of the Halifax Academy, and many other well known provincial names.

Howard Murray, B. A. (Lond), Classical Master in the Halifax Academy, gave an able public lecture in Halifax, March 4th, on the "Woman of Greece."

We have received the "Programa Pora, 1890," "Ano XII." of the "Institute Internacional," of Santiego, Chile. In the "Cuerpo De Professores," we are glad to see the name of "Sr. don Archibaldo Troop," of Nova Scotia. He is one of a faculty of the twelve professors of the institution.

BOOK REVIEWS.

Physical Drill for Public Schools, in four parts, with illustrations. Part I., Foot Drill; Part II., Arena Drill; Part III., Calisthenics; Part IV., Physical Exercises with Wands and Dumb-bells, systematized and arranged in eight grades to suit all classes; by Sergeant-Major D. Bailey, Military Gymnastic Instructor. pp 127. 16mo. (T. C. Allen & Co., 126 and 127 Granville Street, Halifax, N. S.) This is the book for which the teachers of the Atlantic provinces have been long waiting. It contains a great variety of exercises from which may be culled what can be most effectually utilized in the ungraded miscellaneous school, and in graded schools of all degrees, or in public or private gymnasia. Directions in the printed text are supplemented by a number of wood-cuts. These exercises have been arranged and selected by the most successful and popular gymnastic instructor in Canada, and were tested in the Halifax schools under the supervision of the ablest educational critics in the province, at whose suggestion this capital hand-book took finally its present form.

Stirpiculture, or the Ascent of Man, by A. P. Reid, M D., etc., Superintendent of the N. S. Hospital for Insane. Read before the N. S. Institute of Science, 13th January, 1890. 12 pages. (For sale by T. C. Allen & Co., 124 and 126 Granville Street, Halifax, N S.) Dr. Reid's ideas point him out as a progressive man. We do not profess to endorse his views explicitly, but we think he is doing valuable work in calling the attention of the public to the advantage of special care in "raising good human stock" as a stock-breeder might put it. He lays down *six* laws as sufficient to direct the growth of the bulk of humanity towards a more perfect ideal. 1st. Hereditary Transmission. 2nd Indissolubility of the marriage tie with its home associations. 3rd A correct appreciation of the dignity of labor, and that all individuals be trained to make their own living by the hand as well as the head. 4th. Moral training with fixed or positive religious ideas. 5th. A general and practical education. 6th. Definite instruction in sanitary laws.

The Conversation Method in German; Part I. by Hans Lothar Bober, Teacher of Modern Languages, and A. McKay, Supervisor of Public Schools. pp. VII.+150, 12mo. $1.00. (T. C. Allen & Co., 124 and 126 Granville Street, Halifax, N.S.) Typographically this little book is beautifully got up; and considering the difficulty attending the setting up of German by English compositors, the text is remarkably free from errors. The volume proves one thing—that for good press-work no author need go beyond the Atlantic provinces. The book has been published for the use of Professor Bober's classes. This talented teacher shows in his method the highest development of the Commenian System. Without the use of English he makes his students first think, then speak in German. The system is certainly the natural one, for in a few weeks it enables the learner to understand and use the German idiom with a naturalness which months of lumbering translation could not effect. From personal experience we have entirely lost conceit in the sole pre-eminence of the English teacher; for our German confère shows a polish—a power—and an intelligence which we have never seen excelled. German teachers will find this book a valuable aid in enabling them to teach the language in the most effectual manner known to pedagogy.

Arithmetic for Beginners; by J. Brooksmith, M. A., LL. B., St. John's College, Cambridge, England, and E. J. Brooksmith, B. A., LL. M., Instructor of Mathematics at the Royal Military Academy, Woolwich, England; pp. 191, 12mo. (London, MacMillan & Co., and New York, 1889) This is a capital book for schools in England and is a good book here. A chapter is devoted to the "Decimal Money" and the Metric System; but there is so much of the antiquated tables of money, weights and measures, which in other generations must drift out of general use in the world, that we can commend it to the teacher as a collection of well graded exercises from which he can cull, rather than to the pupil who has to prepare himself for future work at the least possible expense of time and effort.

Aus Dem Staat Friedrichs Des Grossen, von Gustav Freytag, edited with notes by Hiram Hager, Ph. D. (Leips.) Lecturer in the German Language and Literature in the Owens College, Victoria University, Manchester. pp. 115, paper, (D. C. Heath & Co., Boston, New York and Chicago, 1889) Heath's Modern Language Series is a most valuable acquisition to us English. The gems of foreign literature are brought before us under the most delightful circumstances possible—good print, careful editing and notes, showing the soundest judgment as to the best manner of making the difficult easy. This volume is a good example of the series.

The Elements of Astronomy, a text-book for use in high schools and academies, with a uranography by Charles A. Young, Ph D., LL. D.; pp. VII.–470, 8vo., $1.55. (Ginn & Co., publishers, Boston, U. S. A., and London). This is a handsome volume, with a capital analysis of matter expressed in its typography. The treatment of the subject is admirable; for without introducing higher mathematics than the algebra and geometry of our high schools, all the leading principles of the science are very clearly presented. Occasionally in the foot-notes and appendix a trigonometric formula appears for the benefit of the more advanced student. A description of the constellations, with star-maps, is also included in the appendix. Its astronomical data are the newest. On the whole, we cannot say that we have seen a better presentation of the subject in any elementary form.

Livy, Book XXI., with notes and vocabulary, by J. E. Melhuish, M. A., Assistant Master in St. Paul's School. London; MacMillan & Co , and New York. This is a neat little volume in the elementary classic series, which has proved so cheap and valuable to the student. The notes and vocabulary are so complete that the student needs no other aid to the text than a good grammar.

Fractions. Ginn & Co., Boston, publish two very useful little pamphlets—a teacher's edition and a pupil's edition of objective and oral work in fractions. Both are illustrated with diagrams, many of which are attractively colored, and many examples are given for seat-work. In the hands of an intelligent teacher these pamphlets should lead to a clear and accurate knowledge of fractions. Price, 35 cents each.

A Short History of the Roman People, by Wm. F. Allen, late Professor of History in the University of Wisconsin, pp. 370, mailing price, $1.10. Boston, Ginn & Co., publishers. Students who have read the interesting volumes recently published by Ginn & Co.—Myers' General History and his History of Ancient Greece—will welcome this one, which is in the same series, by the late Prof. Allen. This sketch of Roman history places especial emphasis upon two series of events: first, the policy and process by which the Roman Dominion was secured and organized during the Republic, its re-organization under the Empire, and final disruption at the time of the German migrations; secondly, the social and economical causes of the failure of self-government among the Romans, and the working of the same forces under the Empire; in this point of view the history of religion among the Romans is carefully traced. In maps and typographical excellence the book is all that could be desired. The "errata" slip at the end of the book, the insertion of which was, no doubt, unavoidable, should be consulted by the student before beginning his readings.

Syntax of the Moods and Tenses of the Greek Verb, William Watson Goodwin, LL. D., Eliot Professor of Greek Literature in Harvard University. Ginn & Co., Boston, U.S.A. We welcome with decided satisfaction this beautiful and much enlarged edition of a work which, in its previous form and humbler dimensions, has been greatly valued by students of the Greek language. It is one of the most important contributions to Greek syntax of recent years. And although it may not attain the popularity of former editions, it will be more highly prized as a work singularly useful for private study and as a book of reference. We would say that the most distinguishing feature of the new edition is "the discussion of the origin and development of constructions." But when the work, from beginning to end, affords abundant evidence of mature study and intimate acquaintance with the Greek scholarship of Europe and America, it becomes a difficult task, particularly after a cursory examination, to single out sections as being more admirable than others. Everywhere there is indisputable evidence that the author is profoundly versed in the literature of Greek criticism, eminently discerning and sensible, and gifted with that rare attribute of scholar's lucidity in statement. This volume will prove an inestimable boon to all students and teachers of the Greek language.

Jeanne D'Arc, by A. DeLamartine, edited with notes and a vocabulary by Albert Barrère, Professor Royal Military Academy, Woolwich, England; Examiner to the War Office; Officier De L' Instruction Publique. pp. 188, paper. (D. C. Heath & Co., Boston, New York and Chicago, 1889). This small volume is another good example of Heath's Modern Language publications. In addition to foot-notes there is a vocabulary of words unlike the English, so that the reader has a vocabulary unburdened with any unnecessary words, and every facility to read the volume at sight. The volume is not only a leading French classic, but the subject matter is of the deepest interest were it but rudely translated into English. It is worth study alone for the intensely vivid picture of a very strange character in a very remarkable age.

Laboratory Manual of Experimental Physics. A brief course of quantitative experiments intended for beginners; by Albert L. Arey, C. E , Instructor in Physics, Rochester Free Academy, with illustrations pp. 200, $0 75. (Syracuse, N.Y., C. W. Bardeen, publisher, 1890) Progress is certainly being made in our science text-books. They are becoming guides to science instead of substitutes. Seventy leading experiments are described, with a blank ruled page opposite to record the results. It is more correct to say the seventy experiments have particular directions given as to how they may be carried out. We would like to see our teachers test such a book with their physics classes. They will, of course, require laboratory room; and in connection with our academies and high schools, we believe the day is not far distant when physics, chemistry and physiology will be taught in the laboratory. It will require more accommodation; but the commencing laboratory work of to-day will, in a few years, develop into full class-work of a practical kind in every high school of any standing. Study nature directly from itself and not as in fiction, from the shadow of another's impressions.

RECEIVED.

Minna von Bornhelm, a comedy in five acts. D. C. Heath & Co., Publishers, Boston.

Two Great Teachers; Roger Ascham and Thomas Arnold. C W. Bardeen, Publisher, Syracuse, N. Y. Also by the same publisher—

Pedagogical Primer, No. 1. on School Management

LITERARY NOTES.

Ginn & Co., Boston, will publish shortly "Sidney's Defence of Poesy," edited by Albert S. Cook, Professor in Yale University. This volume will furnish an admirable introduction to a general course in poetry, or to the poetry of the Elizabethan age in particular; as one of the best specimens of the earlier Elizabethan prose, it will be useful to the student of English prose in its historical development; and as the first annotated edition of the Defence of Poesy, in a critical text formed by the collation of the two earliest copies, it will be indispensable to libraries, public and private.

Ginn & Co. will publish soon Harvard Historical Monographs. No. 1, A History of the Veto Power in the United States. This will include a chapter on English and Colonial Vetoes. No. 2, An Introduction to the Study of Federal Governments. To this will be appended a parallel arrangement of the texts of the four most important federal constitutions—those of Canada, Germany, Switzerland and the United States.

A careful comparison of Secondary School Programmes, French and American, will appear in the May *Popular Science Monthly*. The author, Mr. George W. Beaman, maintains that, if our high and preparatory schools are to compare well with those of France, the pupils must not only do more work but they must also work on more distinctly specialized lines.

PUBLICATIONS RECEIVED.

The *Century* for April has a frontispiece illustration of a Madonna and child, the sixth article of the autobiography of Joseph Jefferson, the latest Siberian Tragedy and other interesting articles. In the Present Day Papers there is a call for improved educational facilities and compulsory attendance at schools everywhere....In the *Popular Science Monthly* for April there is a paper by Prof. David Starr Jordan, on Science in the High School, which will bear reading twice.... *Wide Awake* for April is an admirable Easter number....The *Bookmart* for March has an excellent sketch of Dotheboy's Hall, Yorkshire, the residence of the famous Mr. Squeers....The *Scientific American* of a recent date has an illustration and sketch of the Halifax Dry Dock—the largest on the American continent....*Garden and Forest* for April has a fine illustration of the Sugar Maple, with an appropriate article on this useful tree....*St. Nicholas* for April opens with an illustrated sketch, "Six Years in the Wilds of Central Africa," by one of Stanley's pioneer officers....The New York Printing and Engraving Company, 320 Pearl Street, New York, has issued one of the neatest and most original calenders of the season. It is a model of photo-engraving art.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N.S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

Zoology, 8 lectures—By Principal A H MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.

Botany, 8 lectures—By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.

Mineralogy, 8 lectures—By A J. Pineo, A. M, Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.

Physics, 8 lectures—By Principal E McKay, New Glasgow.

Chemistry, 8 lectures—By Prof. A. E. Coldwell, Acadia College, Wolfville; assisted by W. E. Kennedy, Esq., Halifax Academy.

Physiology, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville

Geology, 4 lectures—By Prof. Kennedy, Kings College, Windsor.

Astronomy, 4 lectures—By Principal Cameron, Yarmouth Academy.

Tonic Sol-fa—Miss A. F. Ryan, St. Mary's School, Halifax.

Elocution—By Miss H. E. Wallace, Acadia Seminary, Wolfville.

Modern Languages—By Herr Lothar Bober, Halifax.

It is only in very exceptional circumstances that teachers and science students can take a holiday excursion so cheap, so profitable, and so delightful and refreshing as that here offered. Class fees from $2 00 to $6 00; board, $6.00, with free or one-third return tickets For a person living 100 miles from Parrsboro, $15.00 will easily cover necessary expenses—including apparatus, etc.

Laboratory and Field work will be made the basis of all the science teaching.

There will be an opportunity of acquiring a theoretical and practical knowledge of Tonic Sol-fa

The talented elocutionist of Acadia Seminary has consented to give a course of lessons on "Voice Culture and the Teaching of Reading."

Herr Lothar Bober, whose classes include the leading educationists of Halifax and Truro, and who is most favorably known in Fredericton and St. John, will illustrate the true method of acquiring a conversational mastery of modern languages

The attention of teachers and science students in the Maritime Provinces is invited to the professional and practical advantages of this Summer School.

For a calendar giving full particulars regarding text-books, their cost, apparatus, etc., recommendations from the lecturers, etc, address A. McKay,

Secretary Summer School of Science,

Halifax, 7th February, 1890. Halifax, N S.

Educational Exhibit.

This Department purposes to make an Educational Exhibit in connection with Canada's International Exhibition, to be held in the City of St. John, opening September 24th and continuing till October 4th and respectfully solicits the co-operation of Teachers and Boards of Trustees in this behalf.

The Exhibit will consist of (1) Specimens of Manual Work. (2) School furniture, apparatus, maps, text-books, photographs of school-buildings, etc.

Specimens of Manual Work should embrace the requirements of the course in this respect, both in graded and ungraded schools.

GRADED SCHOOLS.—Specimens from the several Standards to be as follows: Standard I.—*Common print, modelling of forms in clay, paper forms.* Standard II.—*Print script, modelling in clay, paper forms, representation of school-room* as embodying first ideas of a map. Standard III.—*Print scrip, modelling in clay, paper forms, drawings* from Shorter Course in Form Study and Drawing, *map of County.* Standard IV.—*Writing*—answers to questions on reading lesson and weaving them into a conneced narrative, *modelling* and *drawings* as before, *map of the Province.* Standard V—*Writing*—a short narrative composition, or the substance of an oral lesson on the effects of alcohol on the organs of circulation, *modelling* and *drawings* as before, *outline map of the Dominion.* Standard VI—*Writing*—narrative composition, or the substance of some oral lesson in physics, *modelling* and *drawings* as before, *map of one of the Provinces of the Dominion* (not New Brunswick). Standard VII—*Writing* a short historical narrative, or description of some experiment in the chemistry of Common Things, and *one* of the first fifteen propositions of geometry, *modelling* and *drawings* as before, *map of South America*, or Australia. Standard VIII—*Writing*—specimens of accounts and bills; algebra, an easy equation and a problem; expansion of a sentence into a narrative paragraph, or the substance of some oral lesson on respiration, *modelling* and *drawings* as before, *map of Palestine* or *England*

Specimens of *sewing* and *knitting*, as practised in the respective standards, or specimens of work done in schools where the instruction is not graded.

UNGRADED SCHOOLS.—Standard I.—*Common print and print script, modelling of forms in clay* (optional). Standard II—*Print script, modelling* as before, map of school room. Standard III—*Print script,* answers to questions on Reading Lesson, *modelling* as before, *drawings* from Shorter Course in Form Study and Drawing, map of County. Standard IV—*Writing*—A letter on some familiar subject, *modelling* as before, *drawings* as before, map of the province. Standard V—*Writing*—A short narrative, or substance of a lesson on an agricultural topic, specimens of accounts and bills, *modelling* as before, *drawings* as before, map of one of the Provinces of the Dominion (not New Brunswick), or *outline map of Europe.*

In addition to the foregoing, each school will have the privilege of exhibiting any special work in harmony with the requirements of the Course of Instruction.

As the Shorter Course in Form Study and Drawing has only recently been taken up in the schools, teachers may, if they prefer, forward specimens of work done by the more advanced pupils in the previous course.

In Grammar or High Schools in which the work is in advance of Standard VIII, specimens of such manual work as is practised may be forwarded; also written translations from Latin, Greek, or French into English, or *vice versa.* Specimens of demonstrations, or solutions of mathematical problems, chemical equations, and illustrative diagrams, arising out of some experiment which the pupil has performed or seen; and illustrations of other work in Natural Science.

It is recommended that all the pupils in a Standard participate in the exercises of the Standard, and that the larger number, at least, of the specimens be forwarded, the object of the Exhibit being to show the general character of our school work, and not merely to display the performances of exceptional pupils.

The Exhibition Committee intend to award prizes in each Standard, or to recognize in some way the merits of the work.

The name of the School and the number of the Standard should be written at the top of each paper, and the name of the pupil at the bottom, near the right hand corner. Models should indicate in some way the Standard and name of the pupil.

All the papers from each school should be arranged according to their subjects, in Standards, and made up into a package addressed (prepaid) to the Education Office, Fredericton. Modellings should be neatly packed in boxes, with sliding covers, with the name and number of the school or district, inside the cover, and addressed as above.

All school work intended for the exhibit should be forwarded to the Education Office not later than the last day of the current term—June 30th.

The papers will be bound into folio volumes before being forwarded to the exhibition, as was done in the case of the London exhibit, the Boards of Trustees of cities and incorporated towns, and all other towns having a school enrolment of over 200, bearing the expense of binding their own papers, which will be but little.

Paper of the following sizes should be used: For Writing and Print Script, Orion Superfine Post, 11x8½; Drawings, Extra Superfine Royal (44) Ledger, Cream Wove, 12x9½; Map, Toned Double Royal (60), 13½x10¼.

Special work or maps may be double size.

Friday, October 3rd, will probably be allowed as a holiday to such schools as contribute to the exhibit.

After the Exhibition, the exhibit will receive a place in the Educational Museum at Fredericton.

WM. CROCKET,
Chief Superintendent Education.

Education Office, Fredericton, N. B.,
April 8th, 1890.

GEOGRAPHY May be made pleasant and profitable by using the following new aids:

Picturesque Geography. 12 lithograph plates, 15x20 inches, and pamphlet describing their use. Per set, $3; mounted, $5.

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Jackson's Earth in Space. Presents simply the main features of Astronomical Geography for Grammar and Intermediate Schools. The only book on the subject. Retail price, 40 cents. Just introduced into the Boston Grammar Schools, and authorized for New York also.

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Redway's Manual of Geography for Teachers. 1. Hints to Teachers. 2. Modern Facts and Ancient Fancies. Retail price, 65 cents. To illustrate its popularity, over 1000 copies have been sold to Pennsylvania teachers alone in the last few months.

Progressive Outline Maps, printed in dim outline, to be filled in by the pupil, with the graphic representation of all kinds of geographical facts. Thousands of cities and towns are using them. ☞ Sample Map and Circulars free. Price by mail 2 cents each; $1.50 per hundred.

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McGILL UNIVERSITY,

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The Calendar for the Session of 1889 90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 16th. 1889).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 16th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

(Address McGill College.)

J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

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Harvard University offers summer instruction in the following departments, viz.:

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Except the courses in Medicine and the advanced courses in Geology, they are open to both men and women.

For information, address Secretary of Harvard University, Cambridge, Mass.

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A new Home Treatment.—Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research however, has proved this to be a fact, and the result is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks. N.B.—For catarrhal discharges peculiar to females (whites) this remedy is a specific. A pamphlet explaining this new treatment is sent on receipt of ten cents by A. H. DIXON & SON, 303 West King St., Toronto, Canada.—*Scientific American.*

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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., MAY, 1890. WHOLE NUMBER, 36

A. H. MacKAY, B. A., B. Sc.,
Editor for Nova Scotia.

ALEX. ANDERSON, LL.D.,
Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

THIS number finishes the third volume of the REVIEW. The encouragement that has been extended to it since its publication began gives assurance that its monthly visits are welcome. We hope to make it doubly valuable to our readers, if they will assist us, and they may do it in several ways: By taking a personal interest in their own educational paper; by sending to its columns something bright and helpful to others; by suggesting, if it does not meet their requirements, something that will add to its value; and—what is very important to the paper and its subscribers—by not allowing themselves to get in arrears in their subscriptions.

FRIDAY, the 16th of May, has been selected as Arbor Day for New Brunswick. We hope the day will be observed with enthusiasm and that the aim will be steadily kept in view to make more beautiful and pleasant the surroundings of every school building throughout the province. The little that is done every year, in cleaning up school premises, in planting trees and protecting and fostering the growth of those already planted, will repay all the effort that is put forth.

THE Annual Convocation of Dalhousie College and University took place at the Halifax Academy of Music on Thursday, April 24th, and the proceedings were of more than usual interest. The degree of B.A. was conferred on seventeen, and that of B.L. on eighteen graduates—perhaps the largest number that the institution has turned out in any previous year. This is a matter of congratulation, not only to the president and faculty, but to the province at large. Dalhousie deserves its popularity, and has room within its ample halls and class-rooms for many more students. With its endowments, the excellence and variety of its courses, it should send out three times as many graduates in the near future.

THE teachers of St. John have a warm feeling of attachment and respect for the trustees who have just retired from the School Board. Mr. Boyd, the Chairman of the Board, has long been a welcome visitor in the schools, where his presence was always an inspiration and encouragement. The active and intelligent interest that Mr. Ellis has never ceased to manifest amid the absorbing duties of his profession will always be a source of grateful recollection to the teachers of St. John.

WE have been fortunate enough to be able to inspect the work of the students at the Victoria School of Art and Design in Halifax at the closing of the winter term. The staff, consisting of headmaster George Harvey, A. R. C. A., assisted by J. T. Larkin, Esq., Engineer, Chas. H. Hopson, Esq., Architect, and Miss L. Cornelius, are to be congratulated on the superior character of the accomplished in each of their departments. There were most gratifying evidences of genius in the handiwork, the marble statuary, clay modellings, painting from nature, monochromes from statuary, designs, machinery drawings, and general constructive drawing, architectural drawing, etc., etc. The province has at length a most valuable institution fairly inaugurated. Four *free* scholarships are open for competition to our county academies and high schools on the syllabus of drawing prescribed for the high school course. Four free scholarships open for competition to Halifax, were won respectively by Miss Perry and Miss Smith of the Halifax Academy; and Miss O'Brien and Miss Mahoney of St. Patrick's Girls' High School. To the public spirit of a few Halifax ladies and gentlemen, who spared no effort to arouse public interest in art education, is the finding of funds to found this institution; and them especially will be due the thanks of a grateful country and posterity.

Just as we go to press some important contributions come to hand. Correspondents should remember that to insure insertion their favors should reach us on or before the first of each month.

EDUCATIONAL REPORTS.

Chief Superintendent Crocket estimates that 22,000 children in New Brunswick, between the ages of five and fifteen, were not enrolled in the public schools last year. This is over twenty-five per cent of the children in the province between these ages. This fact seems to call loudly for the passage of a law compelling parents to send their children to school for at least a portion of the year.

Concerning the subjects of instruction, Supt. Crocket notices that a larger number of pupils than usual have been instructed in several important subjects, "which, though not of much educative, are of much practical value." Summing up the subjects taught in the course, he says: "It is possible that pupils may pass through the subjects and still be ill prepared to enter upon their duties. * * * There is still too much book work to the exclusion of things, and too little attention given to the connection between what the pupil is taught and the world around him. It is here, I believe, and not in the course, that the defect exists.

We agree with this, and further, we think that the discretion of teacher and examiner should be used in giving more prominence to important subjects and such as shall have a practical bearing on the pupil's after life. If there is too much laid down for the higher grades of advanced schools to accomplish successfully, there should be more attention given to the important parts of the course. If pupils in the higher grades of advanced schools receive constant and careful drill in how to use their own language, and in the ordinary rules of arithmetic, with the ability to write a legible and fairly rapid hand, it will be of vastly more service to them, either in going directly to business or pursuing a higher course than if they had been *crammed* to an equal degree with all the subjects of the course. The knowledge of geometry, algebra, Latin, Natural Science, that the pupil gains during the last year or two at school is of real service to him or it is useless. The "how many pages have been gone over?" is of little importance; the important question is, *How* have these subjects been taught? "It behooves the teacher," says Supt. Crocket, "to examine his methods and his practice. * *" Now, as the grading time draws near, let the examiner also begin to take an introspective glance.

Chief Supt. Crocket regrets that there is a slight falling off in salaries of teachers. "It is not to be expected that the men and women who are fitted to carry on the work of our schools will have much desire to remain in the profession if their salaries are reduced. When the best teachers leave, the tone of the schools is lowered and the whole service suffers. It is an ill-advised economy that seeks to maintain on the scantiest allowance a service which is essential to the preservation of order and the strength and progress of a country."

We have received the eleventh annual report of Chief Supt. Montgomery, of the P. E. I. schools. He judges that the educational record of the past year is on the whole satisfactory, but regrets the departure from the profession of the "best and most experienced teachers, and the accessions to the profession do not fully make up our loss in any respect except in numbers."

We have received from Geo. S. Milligan, LL. D., Superintendent of Methodist schools in Newfoundland, the report of schools under his jurisdiction for the past year. The results of the year's operations of schools, he states, indicates certain and substantial progress. His recommendations—increase of salaries for teachers, free public schools, and the adoption of a reasonable measure of compulsory education—show that the colony is imbibing broader and more liberal views in education.

We are indebted to D. Wilson, Esq. B. A., Inspector of Schools, for a copy of the report of Public Schools for British Columbia. It is an interesting document, and shows that the Pacific Province is rapidly taking an advanced position in education. Among the leading teachers and school officers are the names of many Atlantic Province students and teachers.

FREE SCHOOLS IN THE BRITISH HOUSE OF COMMONS.

In the House of Commons on the 21st February last, there occurred a very notable debate. Conspicuous alike by the distinction of the gentlemen who participated in it, and the dignity, good sense and statesmanlike grasp which characterized the speeches, it ought to win our interest and convince us that if the growth of public opinion in Great Britain is slow, yet when a great idea has gained a lodgment in the mind of the people it is sure, sooner or later, to develop into practical form. When free education was advocated by Mr. Chamberlain more than twenty years ago it met with but a cold reception, and when, subsequently, a resolution on the subject was introduced into the House of Commons not more than sixty members followed its proposer into the lobby. But in the interval, from 1870 till the present time, it has continued to grow in favor. As an article of the "unauthorized programme," in 1886, it was urged by Mr. Chamberlain upon the statesmen and electorate of Britain with remarkable ability, lucidity and power, in a series of speeches which communicated an extraordinary impulse to the popular movement in support of it. Last year free elementary education was granted to Scotland, and now both parties in Parliament have accepted the principle of the obligation of the State to provide free education in all elementary schools in England—the only question remaining to be discussed being the time when, and the manner in which it is to be done.

On the present occasion there was a singular unanimity among the speakers as to the necessity of assent to the free school principle as the logical complement of the education act of 1870. And notwithstanding the vigorous protest of Sir R. Temple, it must be conceded that there was little opportunity for difference of opinion on this part of the subject. It was held that it was the duty of the State to see that every one of its future citizens is qualified to play his part intelligently in the government of the country, and that he has the opportunity of preparing himself to earn a living; and that as the community is just as interested in this as the man himself, and perhaps more so, the community ought to provide the expense. It was also urged that, should the government undertake this responsibility, compulsory attendance could be enforced without irritation, and that with increased and regular and cheerful attendance, the work of the teacher would be greatly improved. And the fact was emphasized that not only would the poor be relieved of a burden, but they would be spared the indignity of appearing before the poor-law guardians by being placed on an equality with their more fortunate neighbors.

The chief difficulty that stands in the way of immediate legislation is the vast number of voluntary schools in the country and the difference of opinion that prevails respecting them. In England there are 19,200 elementary schools receiving aid from the State, and of these not more than 4,600 are under the government of School Boards, the remaining 14,600 being in connection with the various religious bodies. These latter do not participate in the school rate, but are subject to examination by the government inspector and are assisted according to the terms of his report. For additional support they depend upon the voluntary contributions of the religious denomination to which they belong. In the year 1887–8 the amount obtained from this source was $3,725,000, while the average number of children in attendance was 2,255,000. During the same period the total sum received in fees in State aided schools amounted to $9,311,500. Of this $6,204,500 was collected in voluntary schools. From these figures one can perceive the financial magnitude of the interests involved, and the prodigious outlay that would have to be undertaken by the government should they, in framing a measure, render it impossible for voluntary schools to exist alongside of free board schools. School places would be required for more than two and a quarter millions of children, at an estimate varying from a minimum of $140,000,000 to a maximum of $200,000,000, while an additional annual outlay would be incurred by the extinction of these schools to the amount of the sum of the fees and the voluntary subscriptions, $9,929,500. And this leads us to speak of that phase of the difficulty which provides us with the only reason for the existence of these schools as distinguished from board schools. It is not owing to any superiority in the education received in the one set of schools over that provided by the other, for the board schools are generally recognized as being better equipped and better taught. Mr. Mundella says of the voluntary schools, that while some of them are as good as money can make them, many of them are as bad as they can be. They are maintained for the sole purpose of training the youth of the various denominations under the supervision of their respective religious instructors. Religious education is thus guaranteed and a claim for denominational support made good. Private schools, though they share in the government grant, they are managed by their own committees, in their own way, for their own purposes and without the interference of the outside public.

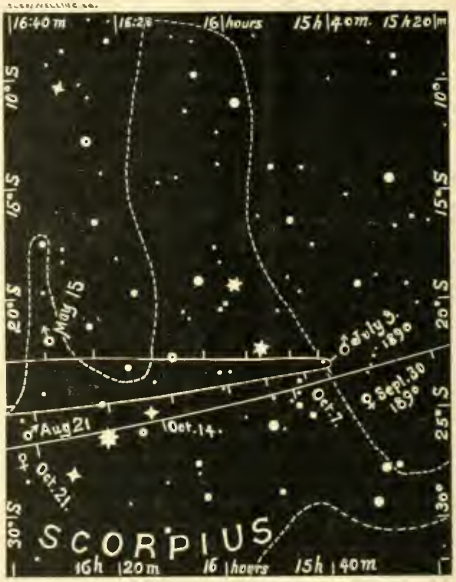
It is manifest, therefore, that if the schools under the School Boards be declared free under a partial system of free education, the voluntary schools will cease to exist, while if it be claimed that popular representation, with a controlling power in their committees, must accompany grants sufficiently enlarged to admit of the remission of all fees, the voluntary contributions will be greatly diminished or entirely fail. But if, as Mr. Chamberlain recommended, an additional grant be made to all schools, voluntary and board schools, equivalent to the fees collected, the difficulty will disappear. Both classes of schools would work as before, the denominational question and the religious difficulty would remain untouched, and the possibilities of increased benefit from the new order of things would be the same for all.

There is little doubt that the time is near when all elementary schools in England, under government inspection, will be open to all children free of charge, but we would deprecate any step that would weaken or destroy the religious instruction that is therein imparted. Not that we desire sectarian teaching, but we consider that no calamity could be fraught with more disastrous consequences than the banishment of the Bible from the common schools. The teaching of scriptures has hitherto been a prominent feature in school work in England and Scotland, and we trust that in the future it will maintain the same distinctive position.

We had a very pleasant visit to the institution for the deaf and dumb at Halifax. J. Scott Hutton, Esq., M. A., the Principal, with his assistant teachers, Mr. Lawrence and Miss Bateman, revealed in one hour more than could be outlined in many columns, as to the development of the idea and use of language in the children of silence. When one sees the intelligence developed against such difficulties, he cannot help admiring the genius of the skilful educator. Some very interesting illustrations of the method of teaching the dumb to speak were given; and a marvellous case of a blind deaf mute from Newfoundland whose training enables him to communicate his thoughts to us in writing. Figuratively, if not literally, the deaf are made to hear and the dumb to talk. Seventy-four have been in attendance during the past year, from the following provinces, Nova Scotia, 56; Newfoundland, 7; P. E. I., 7; and New Brunswick, 7. They have been receiving a course in calisthenics from Mr. J. S. McKay, and in modelling in clay from Mr. Harvey, headmaster of the Victoria School of Art and Design. From their work, we think deaf mutes are specially adapted for excellence in the department of drawing and design; and that in this department they may find a congenial and profitable employment.

Astronomical Notes.

The Scorpion.



Between the middle and end of May and between nine and ten in the evening, look at the south-east sky. That big red star is Mars, the little red one is Antares. It is with Antares and the constellation it belongs to that we have to do at present. The constellation is Scorpio, and is of special interest this year on account of its distinguished visitors. Mars is there now in all the glory of an unusually good "opposition," and he will remain there until the end of August. Then in October Venus will be there in the full splendor of her "greatest brilliancy."

We see Scorpius in the evening during the summer months only, and only at a low altitude. It rises in the south-east and sets in the south-west. When due south and highest up, Antares — which is Alpha Scorpii, and is in the middle of the constellation—is only twenty degrees above the horizon in the south of Nova Scotia, and only sixteen degrees above in the north of New Brunswick. In the mean latitude of these provinces Antares rises at midnight towards the end of March, at nine o'clock about the middle of May, and at sunset early in June. It is due south at midnight near the end of May, at nine about the middle of July, and at sunset about August 8. It sets at midnight at the end of July, at nine about the middle of September, and at sunset about November 20.

So, at nine o'clock we may examine Scorpio from the end of May to the beginning of September; and from the middle of April to the end of October at some time between midnight and sunset. The "nine o'clock" and the "midnight" are mean time.

Scorpius is a constellation easy to recognize and remember even when there is no such distinguished stranger within its gates as there is at present. Antares alone by its brightness and red color is sufficient to distinguish it from the neighboring constellations. Then there is also the arrangement of the stars above and below Antares. With the help of a little imagination those above may be made to take the shape of a boy's kite; and those below, when they can be all seen, make a very good tail, with a curl-up on the left.

This tail—it is the Scorpion's tail on celestial globes—is not shown on our map. In our latitude it trails over only a small arc, low down near the horizon. But it is well worth looking at when you get a good chance. It contains three stars brighter than any others in the constellation except Antares, and contains also several good doubles and trebles for small glasses.

Of the stars that our map does show, those to the left of the broken line belong to Ophiuchus, those to right of it to Libra. The broken line is the boundary of the part of Scorpio here shown. This boundary line, like those of other constellations, is not exactly the same on all star maps, but ours is "according to the best authorities." In regard to the relative brightness of the stars, also, you must not expect our map to agree exactly with all other maps, or even with what seems to you the relative brightness of the real objects. Perfection in this respect is impossible in a map. Make for yourselves whatever corrections you think necessary.

The continuous lines represent the paths of Mars and Venus through the constellation between now and the end of October. The marks along these lines are the positions of the planets at intervals of a week. The bent line is the path of Mars, and the almanac symbol for him stands in front of the dates May 15, July 3, and August 21. The straight line running right across the map is the path of Venus, and her symbol stands in front of September 30 and October 21.

The marks just mentioned you will not find in the sky, but on the given dates you will find the given planets in the given positions with respect to the given stars. The star-marks are of seven kinds—an eight-point star for first magnitude, six-point stars for second magnitude, four-point ones for third, large dots for fourth, medium dots for fifth, small dots for sixth and "dough-nuts" for what in a small glass look like nebulæ.

The eight-point star is Antares, the Alpha of the constellation. The third magnitude one below it on the left is Tau, the one above and on the right is Sigma. (Don't forget that the positions of stars on a map with respect to *right, left, above, below,* are exactly like the sky-positions only when the constellation is on the meridian.) Of the two second magnitude stars, the upper is Beta, the lower is Delta. Below Delta is Pi. These three form the right side of the bow of the kite. The left side is not nearly so well defined. Its three stars are, in order from Beta: Nu Scorpii, and Psi and Omega Ophiuchi. Begin your study of Scorpius by getting the arrangement of the nine stars just named well fixed in your mind; then you will have no trouble afterwards in recognizing the constellation.

Antares is of the first magnitude and is red. Both of these characteristics are obvious at ordinary times, but are somewhat masked at present owing to the proximity of the much brighter and redder Mars. If you have any doubt about it, get Mars out of the way behind a house or something, and then compare Antares in color and brilliancy with the other stars in sight. If you do this when Antares is on the meridian, you won't find half a dozen brighter stars anywhere, nor will you find one as red.

It is to its redness— the same fiery redness that Mars shows — that it probably owes its name. The Greek name for Mars was Ares, and the red rival of the red Ares is Antares. Just at present the star makes a rather sorry rival to the planet, but it is not always thus. The last time Mars passed through Scorpio—in September, 1888—he was but little, if any, brighter than his rival, and one not well acquainted with them would have been at a loss to say which was Ares and which Antares. When he passes there next—in February, 1892—Mars will be less bright than he was in September, 1888, and those who then care to get up in the morning and look at the two can judge for themselves as to Antares' claim to rival Ares.

The red stars like Antares and Aldebaran are supposed by some to be the oldest and coldest stars, the white or blue ones like Sirius and Vega to be the youngest and hottest, others like Capella and our Sun are classed as middle-aged and of moderate temperature. This, like several other astronomical speculations, affords a fine opportunity for committing eloquence. One writer speaks of Antares as "sinking into decrepitude," "having one foot in the grave," etc., etc.; another tells us that when we look at that star "we can actually behold almost the dying throes of a giant brother of our giant Sun." But this is only supposition. Of the age of the stars we know nothing. As to their temperature it is *probable* that the white and blue ones are *at present* the hottest, and the red ones the least hot. What is certain about the pairs mentioned is that they have very different spectra.

Antares is attended by a small green companion of the seventh magnitude, but it keeps so close that a good telescope of not less than three inches (object glass) is required to see it.

Beta is nearly nine degrees north-west of Antares. It is the brightest of the stars in the top of the kite. If Bayer, when naming the stars of this constellation by the letters of the Greek alphabet, distributed the letters according to the then (1610 A. D.) relative brightness of the stars, Beta must then have been the second brightest star in Scorpius. It is not so now. There are three stars in the tail decidedly brighter than it, and two more in the same appendage that excel it according to the photometric observations of Herschel and Pickering. Of those on our map Delta certainly excels it, and Pickering makes even Tau a shade brighter. So Beta, although the second in name, is not even the sixth in brilliancy. Like Antares, it is double—a very pretty double, and not nearly so difficult as Antares, but too difficult for a field-glass. The companion is of magnitude 5½, and is distant twelve seconds of arc. Anything worth calling a telescope will show it.

If you have a first-class field-glass—one that easily splits Zeta Lyræ (see November REVIEW)—try it on the star to the left of Beta. That is Nu. Its companion is of the seventh magnitude and is forty seconds distant. Nu is a double-double like Epsilon Lyræ, but a good telescope is required to show the four.

For a naked-eye pair look at the Omegas below Beta. They are fifteen minutes apart. Try your glass on the "dough-nuts." They are telescopic star clusters. The one near Antares is 4 Messier; the one farther up (on the track of Mars) is 80 Messier.

The lower Omega is almost exactly in the ecliptic, and the sun passes between us and it on November 24th. The distance between the upper Omega and Beta is fifty-five minutes. This is nearly enough to allow two full moons to pass, but to many eyes there does not seem room for one. As a matter of fact the moon does pass right through there sometimes. She will do so every month from September 1890, to August 1891, but not in our latitude. She will do it in our latitude on the 16th of October next, but the phenomenon will not be visible on this side of America. Every month between now and then she will, in our latitude, pass directly between us and Beta, and occult the star; but not one of these occultations is visible here. Next year we shall see the moon pass south of the Omegas, between them and Delta. In 1892 she will be occulting Delta. In July 1893 she will be far enough south to occult Antares, and she will repeat the operation every month after that for about five years.

A. CAMERON.

Yarmouth, N. S.

P. S.—Belcher's Almanac for Nova Scotia and McMillan's for New Brunswick and Prince Edward Island announce that at the end of May Mars will be *too near the sun to be seen.* Wait and see. A.C.

S. P. C. A. Column of REVIEW.]

The Bell of the Tower of Justice.

Once there was a king who was a very uncommon king indeed. He was not proud, selfish and unjust, as kings are so apt to be; he seemed to live only for the welfare of his subjects. This king had a tower built which he called "the tower of justice." Then he said to his Prime Minister, "Hang a bell in the tower, and drop a rope over the wall outside, where any man who has been wronged and who wishes for justice, may reach and ring the bell; for though he be the poorest wretch in our kingdom we will hear his cause and do him right." The Prime Minister did as he was told; and afterwards when any man had been injured by another, or by the laws, he had only to come and pull the rope which hung from the bell of the tower of justice; then the king would assemble his wise men and hear his cause and right his wrongs. When, from long use, the lower end of the rope was worn away, a piece of wild vine was fastened to the end to lengthen it.

Now it chanced that the Prime Minister had a horse that had served him long and well, but which, having grown old and useless, was cruelly turned out on a barren common to take care of itself. One day, being starved, and seeing the vine hanging from the rope, he reached up his head to bite it. The king was sitting in his palace, which adjoined the tower, thinking what new thing he could do for the happiness of his people, when he heard the bell ring. Immediately he sent for his Prime Minister and summoned all his wise men, and all assembled in the tower of justice to hear the cause of the ringing; and lo! it was only the Prime Minister's starved horse pulling the rope as he gnawed away on the wild vine. All were astonished and the Prime Minister was ashamed; and the king said, "Even the poor beast comes to me for justice, and justice he shall have." Then turning to the Prime Minister he said, "O you who neglect in his old age a noble animal that served you faithfully in his youth, how can you be entrusted to administer justice in my kingdom?" The Minister replied, "While I have jealously compelled others to do justice I have acted unjustly, and am unworthy to serve my lord tho king." "Nay," said the king, "you have served well in your youth, and in your old age you shall not be deprived of my favor lest I, too, prove unjust. He whose life has been faithful should not be condemned for one fault." So the wise king retained his Prime Minister, and the horse that had rung the bell of justice was ever after cared for by his old master.—*Animal World.*

What Provision might be made for Technical Education in this Province?

BY W. S CARTER, M. A.

(Read before the Educational Institute of New Brunswick in June, 1889).

In preparing this paper I can lay no claim to originality as I have no opportunity of observing the working of any technical schools, but am indebted for any information I may be able to give on the subject to the reports of the superintendents of the schools of several American cities and to the public press, which has for some time been giving it a great deal of attention.

What is Technical Education, and why are the schools attracting so much attention? The general aim of technical education may be inferred from the names which have been given the schools: Mechanical Schools, Hand and Head Work Schools, Technical Schools, Industrial Schools, Trade Schools, Hand Trade Schools, Skilled Labor Schools, Manual Training Schools. Manual training schools are not designed to give instruction in any particular trade to the exclusion of others, but take in all branches of industry. The prime object is the training of the mind, and the hand as the agent of the mind, and to impart knowledge of such working tools and materials as are found in the great industrial pursuits of the world; to lay the foundation for mechanical pursuits, the same as our present literary system lays the foundation for professional and literary pursuits, and to be an important adjunct in all mercantile callings; so that when our boys graduate they will not be obliged to live by their wits alone, but will have the benefit of the dextrous hand, directed by an intelligent brain. Instruction in the use of the common working tools does not necessarily teach them to become mechanics, any more than instruction in Latin and French teaches them to become lawyers or physicians. Its work is preparatory, not final. To quote a common expression it is "putting the whole boy at school" and educating him on all sides, thus giving him a better mental and physical preparation for life's work.

What of the necessity of these schools? The necessity largely arises from the gradual dying out of the old apprenticeship system. A cry has gone up from the manufacturing centres on this continent that skilled laborers were not obtainable from among our own people and that they had to be imported from abroad. Under the old system the boy was taught every branch of a trade; under the present system, of large factories and the division of work into pieces, it is almost impossible for a boy to learn a complete trade. This state of affairs is gradually turning the public eye upon our schools for a remedy.

A century ago, Pestalozzi and Frœbel suggested object teaching, and may be said to have originated the principles of object teaching. The Imperial Technical School, of Moscow, was the pioneer in the movement for the co-education of the head and hand in 1868, and manual training schools soon sprang up in the other countries in Europe. At the Centennial Exposition in 1876, at Philadelphia, the exhibit of the Moscow school attracted so much attention that its main features were adopted by the cities of Boston, Baltimore, Chicago and St. Louis, and soon training schools were established in those cities in connection with their public schools. Since that time manual training schools have been established in New York, Toledo, Philadelphia, Cincinnati, Cleveland, Omaha, Denver, New Haven, New Orleans, and probably many other cities. Of the Canadian cities, Toronto alone seems to be alive to the necessity of providing such training. Supervisor McKay, of Halifax, in his last report makes a strong plea for industrial training.

The educational tendency of the times is toward manual training; not only have school boards taken up the question but private persons and corporations as well. One great railroad company—the Baltimore and Ohio—and other capitalists, in several instances, as a matter of economy and safety, have established schools at private expense where manual training is taught, and from the pupils in these their employees are selected. This subject is of such importance in England that a national association has been formed, having among its prominent members such men as Prof. Huxley and many other noted educationists, the avowed objects being

(1) The promotion in our primary schools of the better training of the eye and hand, by improved instruction in drawing, in the elements of science, and the elementary use of tools.

(2) The introduction of such changes in the present system of primary instruction as may be necessary to enable children to take advantage of technical teaching.

(3) The more extended provision of higher elementary schools where technical education may be provided for those who are fit to take advantage of it.

(4) The reform of the present system of evening schools, with special provisions for the encouragement of technical (including commercial and agricultural) instruction

(5) The development, organization and maintenance of a system of secondary education throughout the country, with a view to placing the higher technical and commercial education in our schools and colleges on a better footing.

(6) The improvement of the training of teachers so that they may take an effective part in the work which the association desires to forward.

It will, no doubt, be more interesting to the members of this Institute to particularize to some extent and state what is actually being done in the schools of manual training in some of those cities before taking into consideration what is and might be done in the same way in the schools of our province.

There are, as might be expected, different plans adopted in working out the system of manual training in connection with the public schools. In no case that I am aware of are there schools of manual training pure and simple under the control of public school boards. Some of the cities mentioned, in addition to manual training for boys, have incorporated in their school courses domestic economy for girls, but not by any means all of them, though all look upon it very favorably.

The city of Baltimore, one of the first to take up manual training, has perhaps carried it out more successfully than any other. In this city there is a well equipped manual training school, presided over by John D. Ford, an officer in the United States navy supplied by the government. The object of the school is as follows: Instruction and practice in the use of tools and such instruction as may be deemed necessary in mathematics, drawing and the English branches of a high school course. The tool instruction includes carpentry, wood turning, pattern making, chipping and filing, forge work, moulding, soldering and brazing, the use of machine shop tools and such other instruction of a similar kind as may be deemed advisable; the intention being to divide the time equally between manual and mental training.

No foreign nor ancient languages are studied in the school, but great prominence is given to mechanical drawing. Boys must be at least fourteen years of age at admission, and their requirements are about those of pupils passing our eighth grade.

For residents of the city no fee is exacted for the use of tools, materials and books. The fee for non-residents is $50 per year. The course embraces three years, and the literary part of it is closely in line with our Grades IX., X. and XI.

FIRST YEAR.—Arithmetic, algebra, geometry, mensuration, English language, history, geography, physiology and physics.

Drawing,—Geometrical and sketching.

Shop Work,—Carpentry, wood turning, forging, proper care and use of tools.

SECOND YEAR.—Algebra, geometry, plane trigonometry, mensuration, physics, history, English literature and mechanics.

Drawing,—Geometrical and mechanical, or architectural.

Shop Work,—Pattern making, vice work, welding, tempering, soldering and brazing.

THIRD YEAR.— Geometry, plane trigonometry, physics, mechanics, book-keeping, literature, chemistry, political economy, geology and engineering.

Drawing,—Machine, architectural and designing.

Shop Work,—Machine shop work, filing, turning, drilling, planing, etc., study of machinery.

Throughout the course one hour per day is given to drawing and two hours to shop work.

To give some idea of the popularity of this school,—it started in 1884 with 60 students, in 1887 it closed with 273.

The average cost per pupil in 1887 was $24.69. This includes interest on plant, books, materials, salaries and everything pertaining to the cost of the school.

The Superintendent says: "This school does not teach trades. Its aim is more comprehensive—it lays the foundation for many trades and at the same time recognizes the value of intellectual training."

"It is not assumed that everybody who enters this school will be a mechanic. Some will find they have no taste for manual arts and will turn to other paths,—law, medicine or literature. Some who develop both natural skill and strong intellectual powers will push on into higher realms of professional life as engineers or scientists.

"All will gain intellectually by their experience in contact with things. The general result will be an increasing interest in manufacturing pursuits, more intelligent mechanics, more skilful manufacturers, better lawyers, more skilful physicians and more useful citizens."

I have been particular to give details in regard to this school, because I believe a similar one could and should be established at an early date in the city of St. John. It would afford our boys an opportunity to follow a more practical course than is now offered, and would enable them in part, at least, to secure those advantages at home which they now have to go abroad to obtain — to such schools as the Boston School of Technology and other similar institutions. St. John seems destined to become a manufacturing centre and should not depend on foreigners for skilled labor such as she should afford her own boys an opportunity to acquire a taste for and some degree of proficiency in.

For a long time our schools would be at a disadvantage in advanced industrial training in that the teachers have no special knowledge of the practical part of the work. This disability would be the sooner overcome if special instruction in wood and iron working were given in the normal school, with a work-shop attached for males which perhaps might include females, as I see a school of carpentry has recently been established in England for them, and there are many who advocate giving girls and boys the same trades.

Instruction in the subjects embraced by domestic economy is already given in the normal school and city schools as far as my knowledge extends; whether or not it is advisable to include our boys in this class of instruction I do not venture to say, not caring to be in advance of the advocates of women's rights, who do not appear as yet to have considered this aspect of the question.

Let us now for a few moments examine our own course of instruction and see how it compares, as far as it goes, with the courses of other places in the matter of manual training.

In the matter of domestic economy we are fully up to the times. A comparison of our graded course with those of other places shows it to be not less comprehensive than any. In fact many large cities are only now taking the subject into consideration. I think it would be an improvement if the Boards of Trustees should be required to furnish the materials, as parents are very often careless and indifferent about it, and teachers, for the sake of peace, supply it themselves. I think any one skeptical as to the utility of this class of instruction would have been convinced had he visited the exhibit of school work in St. John three years ago.

Should we add practical lessons in cookery to this subject? There can be no doubt as to their great advantages in promoting health and economy in the homes of all classes. Yet, I think, we had better wait until some other places more able set us the example.

Industrial drawing is considered by all as the foundation of manual training. Whatever might be said as to our position in this subject a year or two ago, we are to-day exactly in line. The form modelling in clay and drawing from objects are so arranged as to lead in a practical way from the kindergarten to the machine shop.

I think our course could be extended and elaborated in some particulars. Our pupils might make relief maps in putty, plaster and wax.

Whittling and gimlet work might be allowed as a Friday afternoon exercise. This is extensively practiced in the public schools of France. Much work such as joints, raised maps, brackets and flower racks can be done with knife and gimlet alone.

Cutting and pasting, as a continuation of the kindergarten, has many useful and educative applications.

Our course of instruction is an excellent one as far as it goes; but it has neither proper beginning nor suitable end. I have spoken of the lack of advanced training schools. I will now refer to the almost entire absence of the kindergarten from our system. Were it not for the solitary example of the kindergarten established in St. John about a year ago, and which cannot be considered a pure school of that class, it might be said that there is not one in this province. In this respect I think it can be fairly said we are behind the age. In many of the cities of the United States the kindergarten is a part of the school system, in others they have been founded by the generosity of citizens and afterwards incorporated as a part of the public schools. In all cases they are very numerously attended and are considered a necessity. In the city of Brooklyn, where the children attend the kindergarten *only* between the ages of five and six, and between the ages of six and seven one-half the time the kindergarten, and the other half the regular primary, the Superintendent says: "It may justly be claimed for the kindergarten system that it trains children to habits of obedience and fixed attention, that it makes the eye more accurate, the hand more steady, that it teaches to count and develops ideas of color and form, that it leads to imitation and invention in drawing and design, that it quickens the sensibilities and sharpens the intelligence."

The school spoken of in St. John has proved very effective and popular, and there is room for four or five more could they be provided for. There should be one each in Fredericton, St. Stephen, Woodstock, Moncton and many other places. I have always been of the opinion that a pupil could not as advantageously and profitably undertake the work of Grade I. at the age of five as he could at six years of age, and I am convinced that he would be physically and intellectually benefitted if the intervening year was spent in kindergarten work.

The argument is sometimes used, that by incorporating manual training with our course of instruction the literary part of it may be slighted. In answer to this I will quote from the report of a special committee on manual training appointed by the city of Albany: "It has been uncontrovertibly proven that the combining of the manual with the intellectual does not lower the literary standard of the school. It affords a pleasant relief to the routine of class work and the constant exercise of the memory in abstract problems. Three or four hours a week in the shop will produce marked results and will keep up the boy's interest in his books by this pleasant change. Intellectual development is not to be measured by the length of time passed in the school-room. One hour of active interest in the work is worth more than five hours of indifference. If the interest is only kept up by a change from the class-room to the shop, one great point in a boy's rapid intellectual development has been gained. But the work-shop is not a place of unthinking work It is there the boy is giving tangible expression to his class-room knowledge. As he uses the hammer, chisel and plane, he must study cause and effect. The finished work is the end to be gained, and as he fashions and moulds the rough piece his judgment and reason act in unison with his hands."

In conclusion I will refer to another phase of manual training touched upon by the same committee—the dignity of labor.

"Our counting-houses and offices are over-run with an army of copyists who have graduated from our schools and who have avoided the factory and the shop. The wide field of mechanical pursuits has not been entered by our American boys, but has been left to those from other countries and a very large majority of the lucrative positions in our manufacturing establishments are filled by comparatively recent arrivals from foreign shores. Is not our educational system at fault? Are we not to blame for the surplus on one side and the void on the other? Have we not rather educated our boys for the so-called genteel employments of life and neglected the more practical? The dignity of labor cannot be impressed on our young men by essays alone, example is also needed. If tools were placed in our schools and our boys perceived the necessity of intellectual effort to properly use them, the smoke-begrimed mechanic with his dinner pail in his hand returning from his day's work would be more to them than the embodiment of brute strength. By being brought into daily contact with the implements of toil and a participation in their use they would beget a respect for the dignity of labor, which it is feared is not entertained now."

An eminent French statesman lately said: "Caste ideas would vanish when tools were found in schools alongside of maps and books."

For the Review.]

On Collecting, Preserving and Studying Marine Invertebrate Animals.

BY W. F. GANONG.

(Continued from April number).

I. How to Collect Marine Invertebrates.

There are three distinct modes of collecting, requiring different apparatus and different methods,—collecting on the shores at low water, skimming the surface of the sea with a net for floating animals, and taking deep-water forms with a dredge. The first of these is that which beginners can most advantageously practice.

The places on the shores which are richest in life occur where irregular rocky ledges, with interspersed patches of gravel and sand, are swept at high water by gentle currents of clear salt water. Especially good are clean tide-pools, quiet basins of different sizes near low-water mark from which the water never entirely runs out, and which may contain animals not elsewhere to be taken except by the dredge. Good places usually are the low bars between islands, exposed only at lowest tides and at all other times swept by gentle currents. The times of the new and full moon are the best, for then the tides (as every reader of the Review knows well) run very low or "spring," and leave exposed richer treasures further down among the ledges. A bright day, extreme spring-tide, wind off shore or none, clear-water ledges, a congenial and helpful companion,—these are the conditions which are dear to the heart of the old collector, and which must ensure a rich harvest to the very beginner.

In equipping ourselves for the shore, the following articles, which the present writer's experience has taught him are the best, should be taken. It must not be thought that *all* are necessary, for good work can be done without any one or more, or even without all of them. But this may be regarded as the full equipment.

First of all comes a friend who will help carry your weapons and will act as general assistant, note-taker, tide-watcher, etc., etc., and if possible the friend should sympathize fully in the work. He need not get wet nor dirty in the least. If one is collecting in Atlantic or Bay of Fundy waters, which are very cold, he should wear long rubber boots, but if in Gulf of St. Lawrence waters, which are comfortably warm in summer, he may not find it unpleasant to take to the water, fishermen-style, wading in it with his old clothes on. Of course he will not wear his best clothes on these expeditions. He should take a pail himself, and give another to the friend, and in his pockets carry a dozen small bottles and vials (some containing alcohol) of different sizes, for the delicate and rarer specimens which he will not have the heart to throw among the larger animals to be placed in the pails. A stout knife should be taken, for many forms cling tightly to the rocks. Your friend would do well to carry for you a spade with a stout handle, the use of which will be seen presently. And last, but not least, comes the shore-collector's special weapon, an implement as distinctive of his methods as is the tow-net of the surface-fisher, and the dredge of the dredger,—the handle-net, or scraping-net.

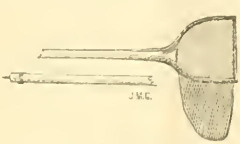


Fig. 1—The Scraping-net.

The illustration shows the form very well. The stirrup-shaped head[*] is made of wrought iron, one inch in breadth and three-sixteenths of an inch thick, made sharp along one side to give a scraping edge, and with holes bored along the other for the attaching of the net. It should be about nine inches across the bottom and about eight inches from the middle of the bottom up to the lower end of the handle. It is to be screwed firmly to the end of a hardwood pole, for which a light pitchfork handle answers very well, though it can be made of spruce or other wood. It should be about six feet in length, and if one wants to make it as useful as possible he can have a short spike, projecting about an inch, set in the upper end. This will make it very serviceable in many ways, particularly as a staff or support in walking over slippery ledges. The net may be of any fine-meshed netting or even of coarse canvass, and is best attached to the frame by means of copper wire. With this instrument the collector can scrape from the rocks and from the bottom many animals in the deep tide pools which otherwise he would have to admire and long for but leave undisturbed. With it also, as he wades along at low-water, he may take forms which he can see below the lowest recession of the tide but otherwise beyond his reach. In fact it may be said that this implement almost adds two or three feet to the recession of the tide, since one can do nearly as much with it as he could without it if the tide were to fall two or three feet lower. If he employ it skilfully, he can with it overturn stones below lowest low-water and scrape the animals from their under sides. It is useful also for taking jelly-fishes and other surface forms as they float past on the rising tide. Its cost is but trifling.

The most profitable shore-collecting is that which is carried on an hour before and an hour after low-water. There are animals above these limits, of course, which are to be taken, but they are comparatively few. Going to our place selected, then, an hour or more before low-water, we follow the tide down. Now we must begin to use our eyes, and if they are untried in this kind of work, they will see little at first. But as they become accustomed to it, it is wonderful how much they do see. An immense number of animals are protectively colored, that is, assume the colors of the substance on which they are living so as to be as little visible as possible to their enemies. None of these enemies, however, have such bright eyes as man, and what may be efficient enough against duller optics are only a partial protection from his. Some forms, too, are very minute, and we must keep on the look-out for them. So as our eyes become trained the very stones and sunken logs and sea-weeds become alive with varied strange and beautiful forms of life. And we must neglect no situation, for there is hardly a conceivable position on the shore to which there is not some one or more forms specially adapted. We must peer into all crannies in the ledges and between the bowlders; lift and search and shake the great masses of sea-weed; overturn stones of all sizes and shapes; dig in the mud or sand beneath these stones and in the tiny beaches of gravel, mud and sand which occur among the ledges; wade slowly, peering sharply, in the shallower tide-pools and scrape the bottoms of those that are deeper; and withal must keep our ingenuity constantly on the alert to imagine new situations in which animals may occur and new methods of getting at them. One must not mind getting a little wet in kneeling and lying down in his search. At first one will collect omnivorously, taking everything, and will have but little time for studying the habits and surroundings of the animals. Before their habits can be advantageously studied one must know their structure, and this can be studied only when one has leisure and comfort after he has left the shore. So at first it is proper to collect everything; the selective and discriminating collecting and the careful study of habits and surroundings will all come later of themselves. We put everything that is taken into the pails (changing the water occasionally in the latter) except the most delicate forms, which should be put into the vials and carefully carried by our assistant. All of our observations on where the animals live and such simple details of habits the same assistant should note down for us. We should keep as near the receding tide as possible. By-and-bye it will stop and then come creeping slowly in, filling the holes our spade has made and our footmarks, and running in tiny streams among the rocks to fill the pools again. But we must fight every inch with it, and not even mind being made a little wet by it. When at length it gains the mastery and we are compelled to leave the shore, we should put in the pails as much sea-weed, of different kinds taken from the lowest part of the shore, as they will hold. This will be good for the animals, as the sea-weeds give off oxygen which the animals need and absorb the carbonic acid gas which is harmful to them. This same sea-weed, when carefully dried in the sun and then thoroughly shaken, will afford many minute Mollusca, Crustacea, etc. It is well to carry back a net-full of it also.

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[*] The stirrup-shape of the frame is much better than the round form generally used and recommended, as it has a much larger scraping edge, and with its angles one can pick objects from cavities or hollows where a round frame could not enter. For a work on shore-collecting, dredging and the study of marine animals of our shores and shallow waters generally, we can heartily recommend "Life on the Sea-shore," by J. H. Emerton, published at Salem, Mass., by Bates.

It is hardly necessary to specify what is to be found in these situations. Under the overhanging ledges, when one pushes aside the heavy curtains of sea-weed, there will be found Mollusca of various colors and sculpture. Some Starfishes will be there and Ophiurans; the brilliant red Holothurians, with some Crustaceans, Sea-anemones and plant-like Hydroids. Amongst the fronds of sea-weed are more Molluscs, some of them very minute. Hydroids, Bryozoa and Crustacea are fond of such situations. Under the up-turned stones, some of which will be so heavy that it will be necessary to use the handle of the spade as a lever (and very useful, indeed, for this purpose it will prove) will be found a great variety of forms, and clinging to the under side of the stone itself are many Tunicates, Bryozoa, Molluscs, Sponges, etc. In the mud and sand are many Molluscs and burrowing Worms and some of the slender Holothurians. In the tide-pools are Sponges, Sea-anemones, Molluscs, Crustacea, Echinoderms, all living and generally abundant. In fact, to sharp eyes and willing hands, no part of the lower region of the shore is barren of life. Descriptions are but feeble; one must go to the shore himself to understand its richness.

Of course this is all in favorable situations. As we go to those less adapted for sustaining life, where there is muddy water or a very uniform kind of shore, we find less, and there are places so unfavorable that they contain comparatively little, but it soon becomes easy to pick out those likely to prove productive. After a while, too, the student will go to the shore to study rather than collect.

A modified form of, and often profitable variation from the ordinary method of shore-collecting, is that in which at low tide on a still day, one is rowed in a boat over shallow water. Very many forms can in this way be seen freely expanded and alive on the bottom, and it is much the best way in which to study the habits of some of the larger animals. With the scraping-net we can pick many things from the bottom.* As the boat moves on, the observer should lie in the bow with his face as near the surface as possible. If there be a ripple on the water the bottom becomes obscure, but an artificial still surface can be made by a simple form of "water-telescope." This is easily made from tin, trumpet-shaped, three or four feet long, three inches in diameter at the upper end and eight or ten at the lower. A piece of glass soldered into the lower end is valuable, but can be dispensed with. A simpler form can be made from a piece of birch bark rolled up, or in other ways which will suggest themselves to the collector whose heart is in his work and whose ingenuity is therefore active.

In my description of these pleasures I have apparently confined them to the stronger sex, for which I now ask the pardon of the fair readers of the REVIEW if I be honored by any of their attention. I beg to assure them that all this is open to them also. The present writer has relatives of their sex who do not hesitate to pin up their dresses to the tops of their rubber boots and follow him into the deepest pools and over the roughest ledges, and whose great interest in the treasures of the shore is not inferior to his.

It will soon be noticed by the student that nearly all of our Invertebrates are either fixed to the bottom when adult or can move but slowly. To prevent the accumulation of the young near the parent, and consequent crowding, and to allow the young to seek new situations, they are almost invariably given the power of free locomotion. They swim about near the surface usually, being attracted by the light and finding the most food there, and are most abundant on still days and on the rising tide. There are also many Jelly-fishes and Crustacea which swim habitually at or near the surface. To take these, the tow-net (or Müller's net) is used.

It consists simply of a brass or copper hoop or ring, one foot in diameter, to which is attached a bag a foot deep, made of "cheese-cloth" or fine book-muslin. Strings are fastened to the hoop as shown in the

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*The present writer has used in this way with great success a scraping-net with a handle twelve feet long. In the passages between the islands about Grand Manan the water is so clear that very small objects can be distinctly seen at a greater depth than this, and with the long-handled net magnificent *Solasters* and other beautiful forms can be easily taken.

figure, and the net is drawn along just on the surface of the water behind a row boat. The best time to use it is on a calm evening on a rising tide, at and after sunset. At such times the surface of the sea swarms with life. As a vast number of these tiny floating forms have the power of emitting light, or, in other words, are phosphorescent, it happens at times that the surface-fisher is treated to sights which cannot for beauty fall far behind what has been so often described as occurring in the Tropics. Often every dip of the oars after dark will start irregular flashes of fire on the water; long lines of flame will roll from the bow, and the net will seem to be floating in a luminous trough behind the boat. But this nobody can well describe; it must be seen.

Fig. 2.—The Tow-net.

Occasionally the contents of the net should be turned into a pail of water and the net itself turned inside out and washed in the pail to free the smaller forms. When the shore is reached the pail should be set aside until morning.

As the majority of the animals taken in this way are very difficult to study (the greater part, indeed, requiring the compound microscope) it is not advisable for the beginner to put much time upon it; his time, energy and means can be more profitably employed in shore-collecting or dredging. Still it has many lessons to teach and should not be altogether neglected.

But abundant as is the life of the shore, it bears no comparison to the number and variety of forms which occur below the lowest limits of the tides. To take these the dredge is required. But having already trespassed too far upon the patience of the readers of the Review, we feel impelled to defer the consideration of this instrument until the next number.

Harvard University,
Cambridge, Mass., April 22nd.

The moment a girl has a secret from her mother, or has received a letter she dares not let her mother read, or has a friend of whom her mother does not know, she is in certain danger. A secret is not a good thing for a girl to have. The fewer secrets that lie in the heart of woman at any age the better. It is almost a test of purity. She who has none of her own is best and happiest. In girlhood hide nothing from your mother; do nothing that if discovered by your father would make you blush.—*Farm and Fireside.*

For the Review.]

London Schools.

In estimating work done in English Board Schools some important points must be noticed, one of which is that the number of these schools, and the range of subjects taught in them, by no means presents a fair picture of the quantity and quality of educational work done in England. Voluntary and proprietary schools of great merit are to be found on all sides, and these are so carefully organized that almost any special educational demand may find supply. These institutions have also afforded a vantage ground for the testing and sifting of theories and methods of the greatest possible diversity, so that any government framing a system of popular education has had an immense amount of work done ready to hand. Nevertheless, in spite of noble foundations all over the country, a heritage from our wise and pious forefathers, and the schools above mentioned, the great mass of the common people have been left to the perils of ignorance.

The exhibition of 1851 opened the eyes of the nation to the fact that they were lagging behind in *productive industry*, and stimulated the beginning of that system of technical education which has revolutionized England, so that taking one of the fine arts alone as an example—that of painting—competent judges aver that for directness, simplicity and exquisite feeling, the artists of to-day stand second to none. The provision for industrial training is not only increasing in extent, so that art, technical and scientific schools form a net work over the land, but their course of study is almost exhaustive in its ramifications, and devotes to the production of manufacturing skill the encyclopedic method.

But successful specialized training presupposes a high degree of intelligence, and unless such training is to be restricted to a class, nothing but the solid substratum of a sound education *for the whole people* can support it. The bill of Mr. Forster, in 1870, in spite of its "*Conscience Clause,*" was the thin end of the wedge, which, driven home, is to destroy the overweening spirit of caste, and a narrow sectarianism, whether of church or dissent, by a national system of free education, open to all, and so thoroughly good that the great middle class will give it hearty support. The whole history of education during the last fifty years is a commentary and illustration of the intensely practical side of English character. Prove that what you advocate is right and needful, and conscience and common sense heartily respond. The last two years have witnessed a great advance, and, in spite of caste and denominationalism, two powerful forces, an immense amount of work has been done. The task of organizing schools for nearly 800,000 children in London alone is almost appalling, and yet it is in a fair way of accomplishment. The board schools are so good in their methods, the discipline at once so gentle and firm, and the teachers are so thoroughly fitted for their work by long years of training that in some neighborhoods even professional people are sending their children to them. The cause of free, technical, compulsory and unsectarian education has, on all hands, able defenders who will eventually, perhaps not just yet, carry their principles. The London school board is a truly representative body, from the Rev. Mr. Diggle, the chairman, who is highly esteemed by all, to Mrs. Annie Besant, who is the member for Tower Hamlets, and stands for socialism and free thought, but is, nevertheless, indefatigable in serving the interests of the fifty-five schools in her division.

INFANT SCHOOLS.

These are under Miss Lyschinska, as inspector, with an assistant inspector. Her ability as a kindergartner led to her appointment thirteen years ago, for although reading, writing and a little arithmetic are required by the code, the schools are really kindergartens. There is a strong feeling among the teachers, that they should be kindergartens, pure and simple, as the children are received from *three years old* and some even younger. As I was piloted to the head mistress by a girl of about ten or eleven, who was carrying a baby upstairs, I remarked, "Do you bring baby to school? How old is it?" "Fourteen months, ma'am. Teacher lets me bring it or else I could not come to school." This was at St. Andrew's School, Wandsworth, a very poor neighborhood, where five hundred children were to be seen eating their penny dinner, a favorite one that day with them, of suet pudding with plenty of jam, in addition to which each child received a slice of bread with cheese. The singing Tonic Sol-fa and Swedish drill were very good, and must be a boon to those poor little ones who need physical culture. The baby's class afforded a striking example of the deteriorating influence of London on the human frame. Two little cousins, of the same age, sat side by side, one a Londoner, pale delicate and small; the other, a Devonshire child upon a visit, a perfect picture of childish health and beauty and would have outweighed the other twice over, as she was head and shoulders above her and plump in proportion. The basket making, weaving, etc., in the kindergarten is distinctively industrial and well done.

MANUAL TRAINING.

A great deal is doing in this as an experiment, but it is so successful and Inspector Ricks so thoroughly in earnest and so competent that it has *come to stay*. The teacher, who is a specialist, being a trained science scholar from South Kensington, has sole charge of this work in the different schools. The boys were making mortise joints and working *con amore*. Drawing and modelling are recognized as absolutely necessary, and manual training not simply as industrial but as a part of *educational development*. This school is also one of the centres fitted up with laundry appliances. The more respectable the children, the more delighted they are with this work and the better they do it.

WILLIAMS STREET, KENSINGTON WEST.

This is one of the best for modelling and drawing, specimens of which were surprisingly good. The Eiffel Tower, with scale measurements, done by a boy of not quite fourteen, left nothing, it seems to me, to be desired, being perfect in its neatness and beauty. The modelling by the same boy was admirable; but better even than any few isolated examples of great merit was the general air of intelligence and skill displayed, not only in drawing and modelling, but in pasting colored paper so as to form patterns for wall-papers, oil cloth, etc., also in relief maps, of which, among others, an excellent specimen of the basin of the Thames was shown. The writing was, as is commonly the case in English schools, very neat and well done. A large number of pupil teachers receive instruction in this school and were engaged as follows: Twenty-three second-year girls, domestic economy lesson, "Chemical changes in milk." Sixteen boys, first and second year, mathematics. (On inquiring if algebra were a *bête noir* at examinations, I was told "no;" remembering that it is a subject which sometimes floors our Nova Scotia candidates, I enquired the reason: "*They take it as soon as possible right along with arithmetic from the first!*") Thirty-nine boys and girls at their geography. Thirty first-year girls at needle work. Teacher at the blackboard illustrating by diagrams the *gusset* and *gore*. The prejudice in favor of very closely set stitches is vanishing, the form and direction of the stitch being of more importance in the judgment of the inspector. Pupil teachers — total number of girls, 180. Total number of boys, 50.

In another room singing was the lesson. A three-part chorus from the music to be sung at the Crystal Palace, June 18th, at the distribution of prizes was sung by boys in good time and tune. The teacher did not care for Tonic Sol-fa, but he thought it well adapted to teach children to sing well and easily.

LANT STREET SCHOOL, BOROUGH.

This school, situated in a poor, low neighborhood, has 1,100 names on the roll and consists of infant schools and also separate schools for boys and girls. The average attendance is 83 per cent. The head master, an efficient, enthusiastic teacher, has had charge since 1877, when the school opened with *two* pupils. An excellent staff of teachers carry on the work of the school from the kindergarten upwards, where they usually come in at three years old, although some were younger. They learn even here some reading, at any rate the alphabet, during their stay of one year, when, if they pass the standard, they are drafted into a higher division. In the highest class of the infant schools, unfortunately, reading, spelling and arithmetic almost crowd out kindergarten work, but the code is inexorable in its demands, and the last six months of the school year are feverish with exertions to meet its requirements, and as long as *payment by results* is the order of the day, the best fruits of good teaching are not likely to be produced. Another annoyance is the collection of fees and keeping an account of remissions and arrearages. It consumes one hour and a half, weekly, of his, the head master's, time to adjust these matters and keep an account of them; and considering that the fees collected in his school only amounted to £44.9s.4d. last year, the game is hardly worth the candle. The gross cost for each child was £3.19s.11¾d. The London school board, to its credit let it be recorded, sends no child away from school because of unpaid fees. The ground site of this school cost £10,000, and the board have lately given as much as 20*s.* per foot for ground on which to build. The drawing and painting in water colors was excellent, especially when you remember that at thirteen years old, if not before, these boys go out to make their own living. But they have learned to obey orders, to be diligent and punctual. Only two boys in one school-room had had bad marks during the year, and in another, a board—"not one late for the week," had been hanging for several weeks, to the great pride of the boys. One boy had not missed being punctually at his school for over three years. Think of the influence for good in wicked homes exerted by such a school and let us take courage. Needle work is taught in the girls' school, which also sends a contingent of twenty to the cooking centre. Modelling in clay was going on in one of the lower rooms and a very pretty drill with Japanese fans, accompanied with singing, was in progress in one of the girls' rooms. In one of the infant schools a bright teacher put them through the exercise of "Sir Roger de Coverly," a contra-dance. This lady devotes much care to the study of old English games, some of which are admirably adapted to school and kindergarten.

An ear-test exercise was given in one of the boys' schools, the teacher vocalizing a few notes which were instantly repeated in Sol-fa, almost always correctly. One boy, rather dull, only recognizes one *passage* of *three* notes, but if he can hold that in his memory he will have a starting-point that will lead him farther afield. This school stood well at the Central Exhibition at Stationers' Hall, to which it sent eight drawings. On the whole, a survey of London board schools not only gives food for thought but a sense of satisfaction, for much of the work done is truly excellent and the teachers are fully alive to their important function. C.

For the REVIEW.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

SIXTH PAPER.

The pupils may be prepared for singing in two parts by such exercises as these following and by singing rounds. Tell the pupils to listen to the other part while singing their own, to hear the two notes of the chord together, and also to get accustomed to singing one tone while a tone of a different pitch is being sung by other voices. The bracket ({) means that the parts enclosed are to be sung together.

```
        Key D.
{ |d:—  |m:—  |s:—  |d¹:—d¹:— |s:— |m:—  |d:—||
{ |d:d  |d :d |d:d  |d :—d :d |d:d |d : d|d:—||
        Key F.
{ |d:d  |m:m  |s :s |m:m  |s :s |m:—  |s :— |d:—||
{ |d:—  |d :— |d:—  |d:—  |d:—  |d :— |d:—  |d:—||
        Key E.
  |d:m |s :m  |m:m|s :m  |s:d¹|s :m  |s : m|d :—||
  |d: —|— : — |d :—|— :— |m:—|— :—   |d:—|— :—||
```

Ear Exercises. Let the teacher sing the following slowly to the syllable *lah*, get the class to copy, sing a second time to *lah* and make the manual signs, the teacher also making the signs, and then to sing the notes and make the signs.

d d m s, s m d s, s m s d, s m r d, d m r d
d d t¹ d, d m r r d, d r m r d, d m r d t¹ d.

THIRD STEP.

The class has been taught the tones of the DOH chord and the SOH chord. The next chord includes the other two tones of the scale, FAH and LAH.

Ask the class to watch for a new note, and sing the following or some such phrases to the syllable *lah*.

```
      Key D.
| d:m | r:d | f :—||.
      Key F.
| d: r: m | f :—: m | r: m: f ||.
```

Try to develop the desolate or awe inspiring effect of FAH. Show the manual sign,—the hand closed, the forefinger pointing downwards towards ME, to which FAH has a tendency to go. Give a few ear exercises, asking the class to simply look for the FAH. Next bring out the mournful effect of the weeping LAH, the manual sign for which is the hand hanging down from the wrist.

Key C.
| d^1 :t | l :— | t :d^1 | m:— | i:—‖
Key C.
| l :l | s :d^1 | t.l :t | l :—‖
Key Bb.
| m :r | d :— | t_1 :— | l_1 :—‖

From the extended modulator it will be seen that the intervals between the tones of this chord are the same as in the DOH chord. So to the left hand, alongside d, m, s, we have s_1, t_1, r, and to the right, f_1, l_1, d. Point on the modulator d, m, s, s, m, d. Next ask the same tones to be sung to *lah.* Then tell them to sing the same tones to f_1, l_1, d, d, l_1, f_1, pointing to these notes on the side column.

Point and sing such exercises as the following and ask the pupils to copy after the teacher has sung each.

Key D.
| d :m | s :— | f :l | d^1 :— | d^1 :l | f :—
| s :m | d :—‖

Key C.
| d :m | s :— | f :l | d^1 : — | s :t | r^1 :—
| r^1 :t | s :— | d^1 :l | f :— | s :m | r :d‖

After the pupils have learned the notes of this chord the teacher may give simple voluntaries on the modulator. Use the new tones only as passing notes.

s DOH^1 *f*
TE *m*
m *LAH* *r*
r SOH *d*
FAH
t_1 ME l_1
l_1 *RAY*
s_1 DOH f_1
t_1
m_1 l_1 r_1

Teach tunes on the modulator, then they may be sung to the manual signs, and next from the books or blackboard. Rounds may now be sung as such.

Accustom the pupils to point exercises and tunes on the modulator from memory and to sing them. If the pupil hesitate to sing alone, ask the class to sing with him the first pointing, and then ask the pupil to sing alone the second time. Encourage and help the pupil. In pointing voluntaries on the modulator avoid getting into ruts, and as far as possible point musical phrases that the pupils are likely to meet. In the modulator exercises anticipate any more difficult intervals that will be met in the new tune to be taught in that lesson.

TIME EXERCISES.

6.—Key A. *Bugle call "Extend."*
{ | m :— | d :— | m.d :m.d | s_1 :—
| m :— | d :— | m.d :m.d | s_1 :—‖

7.—Key F.
{ | d :d.r :m.f | s :— :l | s:f.m :f.s | m :d:d
{ | d :d.r :m.f | s :s :l | s :f.m :f.s | m :—:—‖

8.—Key G.
{ :s_1 | d :— :t_1 l_1 :t_1 :d | r.m :f.m :r.d | d :t_1 :r
{ | s :—.f :m | l_1.r :d :t_1 | d :— :— | —: ‖
taa-aatai taa taatai taa taa taa-aa -aa -aa saa‖

In exercise eight we have a note of one and a half pulses and then a note of half pulse. The tune names are taa-aatai. The last pulse of the measure is silent, so no note is given, the space is simply left blank, no sound, so no sign is needed. The time name is saa. Further, No. 8 is in six-pulse measure, which is made up of two measures of three-pulse, each alternate strong accent becomes a medium accent and is indicated by a shorter line. JAS. ANDERSON.

For the REVIEW.]

Educational Reform.

"*Teaching* is supplanted by the *hearing of lessons.*" * * "The remedy rests with school boards and teachers."—*Editorial in April* REVIEW.

MR. EDITOR,—It seems to a trustee that the "remedy" rests not with the school boards but with the Council of Public Instruction. Let the Council *pro*scribe text-books that allow of the *supplanting* complained of. Teachers then will not have opportunity of *hearing of lessons.* In the meantime blame neither trustees who have no authority and are powerless in the matter, nor the teacher, so long as such books as the three geographies are *pre*scribed to be gotten up by the pupils for grading examinations and inspector's visits. TRUSTEE.

Yar. Co., N. S.

PERSONAL.

W. E. Thompson, Esq., who was last term promoted to the principalship of the Albro Street School, Halifax, is meeting with much success in his work. Some of his pupils have been making interesting observations in the realm of "Nature Lessons." The *Morning Chronicle* intimates that Master Walter Hart of Windsor Street has made the discovery that the Pear Tree Borer—the Pine Borer—lately discovered in the Western Counties has made its appearance in Halifax.

SCHOOL AND COLLEGE.

The following are the number of students standing the terminal examinations in the county academies reported: Halifax, 150; Pictou, 120; Truro, 70; New Glasgow, 70; 133 made application for admission to the Halifax Academy at the entrance examinations.

The examination of candidates for matriculation into the N. B. University will take place at the Girls' High School, St. John, on the 12th, 13th and 14th June. Other candidates for matriculation to the University from the southern section of the province may be admitted to the examination by giving proper notice to the President of the University.

Graduates of the N. B. University will henceforth be admitted to the Junior Class at Harvard without examination, while graduates with honors may be admitted to higher standing after giving satisfactory evidence of work accomplished either while at college or after leaving it.

QUESTION DEPARTMENT.

The population of a town was 7,600 in 1850, in 1870 it was found to be 9,196. If the increase per cent during the first decade was the same as during the last, what was this per cent?

In the first decade the increase per cent is on the population of 1850; in the second decade the increase per cent is upon the original population plus the increase during the first decade; therefore the principle is the same as in compound interest.

In this example

$$A = p\,(1+r)^n \qquad A = 9196$$

$$P = 7600$$

$$\therefore \frac{A}{P} = (1+r)^n \qquad n = 2 \quad \text{(decades)}$$

$$\therefore \sqrt[n]{\frac{A}{P}} = 1+r \qquad \therefore \sqrt[2]{\frac{9196}{7600}} = 1+r$$

$$\text{Extract root} \quad \sqrt{1{\cdot}21} = 1+r$$

$$\therefore \quad 1{\cdot}1 = 1+r$$

$$\text{Transpose} \quad r = 1{\cdot}1 - 1$$

$$r = {\cdot}1$$

$$r = 10\%$$

LITERARY NOTES.

D. C. Heath & Co. will shortly issue a manual on the "Reproduction of Geographical Forms," by Jacques W. Redway, author of the "Teacher's Manual of Geography." It is designed for teachers and students who wish to learn the details of sand and clay modelling as applied to geographical forms, and the projecting, drawing, and interpretation of maps. The manual will be illustrated with the various projections used in map-drawing, including a number of very easily constructed ones that may be used by younger pupils.

BOOK REVIEWS.

Handbook of Newfoundland. This handbook of 123 pages is published by authority of the Surveyor-General of Newfoundland. That the book is an accurate, full and scholarly presentation of the features of this interesting land may be inferred from the fact that its author is the Rev. Moses Harvey, F.R.G.S.

Annual Report of the Newfoundland Fisheries Commission for 1889. This report is of more than ephemeral interest, as it contains much well digested information on the rapidly developing science of fish culture. It will be especially valuable to the Maritime Provinces of Canada. The report bears strong evidence of the masterly genius of the Secretary of the Commission, Moses Harvey, F.R.G.S.

Two Great Teachers; C. W. Bardeen, publisher, Syracuse, N. Y. Mr. Bardeen has done good service to education in compiling in a neat and convenient volume two admirable memoirs of great teachers—Johnson's Memoir of Roger Ascham and selections from Stanley's life of Thomas Arnold, of Rugby. The book will be a valuable addition to every teacher's library.

Minna Von Barnhelm, a comedy in five acts, by Lessing; with introduction and notes by Sylvester Primer, Ph. D., Providence, R. I. Publishers, D. C. Heath & Co., Boston. This, one of the best of Lessing's plays, makes a very desirable text-book for German students. It is not only a classical work of high merit but is very suitable to be placed in the hands of the young. It is another addition to D. C. Heath & Co.'s excellent and beautifully printed "Modern Language Series."

The Coda, containing musical selections and a programme for Arbor Day, has just been published by Ginn & Co., Boston. Price two cents.

Plant Organization, by R. Halstead Ward, A.M., Professor of Botany in the Rensselaer Polytechnic Institute. Publishers, Ginn & Co., Boston. This is a presentation of an outline of work for beginners in plant study. Teachers or private students will find it very helpful as a guide to the thorough and thoughtful study of a few typical plants.

Shakespeare's Macbeth, with an introduction and notes by K. Deighton, Fellow of the Universities of Calcutta and Allahabad. London, MacMillan & Co., and New York. This is an excellent edition for the student, the type clear and the notes suggestive. The introduction deals very clearly with the question of doubtful authorship of some passages in the play; and the summing up on these points, and the vivid character sketches of Macbeth and Lady Macbeth, are excellent.

RECEIVED.

Heroic Ballads. Ginn & Co., Publishers, Boston.

Practical Lessons in German Conversation. D. C. Heath & Co., Boston.

From D. C. Heath & Co., Gœthe's Sesenheim—Huss.

From D. C. Heath & Co., Hoffmann's "Historische Erzahlungen"—Beresford—Webb.

PUBLICATIONS RECEIVED.

The *Popular Science Monthly* for May has many features of marked interest. There is a careful comparison of secondary school programmes—French and American—and the conclusion is reached that the courses of study in our high and preparatory schools must be more distinctly specialized before they will yield satisfactory results.... The *Century* for May, Memorial Day Month in the United States, is made notable for the number and variety of articles it contains on natural life and history. The number is more profusely illustrated than usual.... *St. Nicholas* for May is a fine number and its illustrations and other departments are very interesting.... *Wide Awake* for May has a paper on Spelling, by the master of a Boston public school which gives matter for serious consideration....Recent numbers of *Garden and Forest*, published by D. R. Munro, New York, are more than usually interesting on account of the valuable articles, not only to horticulturists, but to teachers of natural science in our schools....The *American Naturalist*, among many interesting articles in its March number, has the following: "The Teeth, as Evidence of Evolution," by Cahall; and "Instances of the Effect of Musical Sounds on various Animals." The notes under the headings: Geography and Travel, Geology and Paleontology, Botany, Zoology, Psychology, Archæology and Ethnology, are specially interesting....The *American Geologist* for March contains articles specially interesting to Canadians. Some of these are "The Triassic Traps of Nova Scotia, with notes on other intrusives of Pictou and Antigonish Counties," by V. F. Marsters; "On the Dykes near Kennebunkport, Maine," (illustrated). by J. F. Kemp. "The Occurrence of Native Copper in the Animikie Rocks of Thunder Bay," by Andrew C. Lawson; and a sketch of the life of the late Dr. David Honeyman, of Nova Scotia....The *Microscope* continues its serial notes on "The Microscope Stand and some of its Accessories." Wm H. Patterson sketches a home made glass stage and slide-carrier. This monthly is an admirable one for the young microscopist as well as for the expert.

Official Notice—N. B. Schools.

Education Office,
Fredericton, N. B., May 1, 1890.

The Board of Education has been pleased to order that all applicants for admission to the Normal School as student-teachers shall furnish to the Principal a certificate of general good health in the following form signed by a registered physician:—

1. Name of applicant?.................... ....
2. Present state of applicant's health?............ ....
3. Conditions of the different organs?.... ... .
4. Constitution?.................... ... .
5. The effect which attendance at Normal School or employment in the teaching profession would be likely to have on the applicant's health?...................... ....

Wm. Crocket.
Chief Superintendent of Education.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

Zoology, 8 lectures—By Principal A H MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.
Botany, 8 lectures—By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.
Mineralogy, 8 lectures—By A J. Pineo, A. M., Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.
Physics, 8 lectures—By Principal E McKay, New Glasgow.
Chemistry, 8 lectures—By Prof. A E. Coldwell, Acadia College, Wolfville; assisted by W. E. Kennedy, Esq., Halifax Academy.
Physiology, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville.
Geology, 4 lectures—By Prof. Kennedy, Kings College, Windsor.
Astronomy, 4 lectures—By Principal Cameron, Yarmouth Academy.
Tonic Sol-fa—Miss A. F. Ryan, St. Mary's School, Halifax.
Elocution—By Miss H. E. Wallace, Acadia Seminary, Wolfville.
Modern Languages—By Herr Lothar Bober, Halifax.

It is only in very exceptional circumstances that teachers and science students can take a holiday excursion so cheap, so profitable, and so delightful and refreshing as that here offered. Class fees from $2 00 to $6 00; board, $6.00, with free or one-third return tickets For a person living 100 miles from Parrsboro, $15.00 will easily cover necessary expenses—including apparatus, etc.

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For a calendar giving full particulars regarding text-books, their cost, apparatus, etc., recommendations from the lecturers, etc , address A. McKay,
Secretary Summer School of Science,
Halifax, N S.

Halifax, 7th February, 1890.

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Nichol's Topics in Geography. A Transcript of successful work in the school-room. Generally acknowledged to be the best book on this subject yet made. Retail price, 65 cents.

Redway's Manual of Geography for Teachers. 1. Hints to Teachers. 2. Modern Facts and Ancient Fancies. Retail price, 65 cents. To illustrate its popularity, over 1000 copies have been sold to Pennsylvania teachers alone in the last few months.

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McGILL UNIVERSITY,

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The Calendar for the Session of 1889 90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 16th. 1889).

Donalda Special Course for Women—(Sept. 16th).

Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th).

Faculty of Medicine—(Oct. 1st).

Faculty of Law—(Oct. 1st)

McGill Normal School—(Sept 2nd).

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

(Address McGill College.)

J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

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A so-called "Webster's Unabridged Dictionary" is being offered to the public at a very low price. The body of the book, from A to Z, is a cheap reprint, page for page, of the edition of 1847, which was in its day, a valuable book, but in the progress of language for over FORTY YEARS, has been completely superseded. It is now reproduced, broken type, errors and all, by photo-lithograph process, is printed on cheap paper and flimsily bound. A brief comparison, page by page, between the reprint and the latest and enlarged edition, will show the great superiority of the latter. These reprints are as out of date as a last year's almanac. No honorable dealer will allow the buyer of such to suppose that he is getting the Webster which to-day is accepted as the Standard and THE BEST,—every copy of which bears our imprint as given below.

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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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A. H. MacKAY, B. A., B. Sc.,
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G. U. HAY, Ph. B.,
Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

WITH this issue the REVIEW enters on its fourth year. We do not imagine that our success has been due to the excellence of our work. We know that many must have been supporting and helping on our circulation because they felt that a home educational press was a necessity, both from an educational and a patriotic point of view. We are quite conscious of the fact that we cannot write to suit the wants of the advanced specialist and the beginner. Nor did we hope to be equally interesting to the theorist, professors of universities, and teachers of our primary schools. We have attempted to distribute our attentions, while keeping all in touch with the current of educational life in our provinces. We must have succeeded to a very fair degree, judging by results. Yet we have not done all we expected; and our task therefore still remains before us. We expect to be able to enlarge and give more special attention to series of short exercises on all the subjects of our school course. These we shall endeavor as far as possible to make of use to advanced as well as primary teachers. We shall also endeavor to remember that our Journal should always contain material for the general edification of all our readers, especially in the departments which appear more conspicuously neglected in the general newspaper.

While in the leading counties and sections of these provinces nearly all the teachers are patrons of the REVIEW as well as many others interested in education and elementary science, there are several sections and counties in which but comparatively few copies circulate. There are many good reasons why this should be so. Teachers may be supplied with foreign literature, may not require any literature at all, may not approve of our educational policy, may not be able to save a dollar from their too scanty salaries during a whole year, or, as we suppose the case generally is, are not aware of the existence and the "excellence" of the REVIEW. This last we propose to remedy: for we shall have very much pleasure in putting before any one who desires it, a copy of our paper. We cannot sufficiently thank our friends, many of them personally unknown to us, for their kind words and their assistance in extending our circulation. We trust that during the year now entered upon we shall be enabled to attain to something more in effectiveness than we have hitherto attempted; and we feel assured of the assistance of our friends in the future as in the past to help us to attain more nearly the ideal of an educational journal.

THE Nova Scotia Editor wishes specially to thank a number of teachers throughout the Province for their kind words, and their efforts to extend the influence of the REVIEW. With extended patronage the REVIEW can be still further improved.

LUNENBURG is fortunate in the appointment of H. H. Mackintosh, late Principal of the County Academy, to the inspectorship of the district; and in the succession of B. McKittrick, late Principal of Sydney Academy, to the County Academy.

A careful review of the advertising columns of this issue will repay our readers.

Will the correspondent at Dayspring P. O., Lunenburg, N. S., who enclosed a dollar to the Review, kindly send us his name in order that he may receive proper credit?

We can now but barely refer to the reports of the Superintendent of Education for Nova Scotia. While the "registration" for the year has diminished, the "attendance" has been the greatest in the history of the province—a very healthy sign. The school sections have increased from 1860 to 1886. Total expenditure for education $212,921.86, being an increase of $1,725.57 during the year. Male teachers decreased eleven and female teachers increased thirty-seven. The salaries of male teachers of the first class increased on an average ten cents. Salaries of females of the first class decreased eighty two cents. Salaries of second class male decreased $3.62; of female second class $5.47; of third class males, decrease $7.94, of third class females, decrease six cents. Heavy downward tendency in lower grades.

Arbor Day was observed throughout New Brunswick on the 16th of May. From the reports observed, in those districts where trees were planted, and other exercises appropriate to the day were carried out, the interest is this important work of decorating and making school grounds beautiful, is increasing year year by year.

In Halifax a circular order was transmitted to all the schools by Secretary Wilson, ordering the schools to celebrate the 13th as Arbor Day, by addresses on arboriculture, or other exercises impressing the value of tree culture on the pupils, for one hour; the schools then to be dismissed for the purpose of planting trees In the Academy an address was given by the Principal; and two trees were planted and dedicated to the late Principal Dr. Gilpin, and the late English Master, Mr. Waddell. At St. Patrick's High School, Albro Street School, Morris Street School, Richmond School, and at other schools, similar exercises were carried out.

The St. John School of Music was opened by Miss Hitchens in September last. It comprised classes in vocal music only. Receiving considerable encouragement and patronage, it was thought advisable to add instrumental Music, elocution and French. There are now over thirty pupils in attendance. Miss Whitman, of the New England Conservatory, Boston, teaches Piano, Harmony-Theory. Miss Gerow, Graduate of the Detroit School of Oratory has charge of the Elocution; Miss Hitchens, pupil of L. P. Morrill of Boston, one of their leading teachers, has charge of the vocal.

Such an institution is very much needed in St. John, and Miss Hitchens deserves success for the energy she has shown in establishing the school and conducting it so far with success.

A few months ago there was noticed in these columns a work on the Economic Mollusca of Acadia, by W. F. Ganong, M. A., of Harvard University. It is a cheap and valuable publication, and the student in his vacation rambles along the sea-shore, or at the Science School, will find this an invaluable work, written in a popular vein, but it is a concise and scientifically accurate presentation of the subject. It is for sale by Barnes & Co., St. John, for fifty cents.

A Dictionary published fifty years ago may serve as a literary curiosity, but it can hardly serve now as a standard authority, so great have been the advances in philology and the coining of new words in arts and science especially. Yet a Chicago publishing house has reprinted Webster's Dictionary of 1847, copyright on it having expired by the lapse of 42 years. Teachers should be on their guard and not be deceived by attempts to impose on them a cheap reprint with defective vocabulary, and many of the commonest scientific words of to-day absent from its pages.

D. C. Heath & Co., Boston, will shortly publish a manual on the Reproduction of Geographical Forms, divided in two parts—I. Treating of sand and clay-modelling with respect to geographical forms, and II. Of map-drawing and map projection. We have been permitted to see the proof sheets of this work, and think that in the hands of an intelligent teacher, excellent results may be accomplished. Although the directions contained in it are general rather than specific, sufficient valuable suggestions are given to invest the study of geography with a fascination to both teacher and pupil.

An interesting contribution to Canadian history is contained in a paper presented to the Royal Society of Canada in 1889 by W. F. Ganong, on the Influence of Cartier's voyages on early Cartography. This has just been published in the Transactions of the Society, and with the maps accompanying it serve to illustrate an interesting period of early history.

At the recent meeting of the Royal Society in Ottawa the following papers were read: Illustrations of the Fauna of the St. John Group No 5, by G. F. Mathew: The evidence of a Nova Scotia Carboniferous Conglomerate, by E. Gilpin; and Southern Inverbrates on the Shores of Acadia, by W. F. Ganong.

CLOSE OF THE EDUCATIONAL YEAR.

The encœnial exercises of the N. B. University this year were even more brilliant than usual. There was a large gathering of representative men. Dr. Harrison gave an interesting sketch of the life and work of Sir Howard Douglas, the Alumni oration of Rev. J. deSoyres was a scholarly effort, and the conferring of the honorary degree of LL. D. on Lt.-Governor Sir Leonard Tilley called forth great enthusiasm.

The University deserves the hearty support and confidence of the people of New Brunswick, for it fulfils in a marked degree its true function of a Provincial University. It places a sound collegiate training within the reach of all classes of the public, and that, too, on the strictly non-sectarian lines which have been permanently adopted as the basis of our common school system. And the true interests of higher education will be best served, not by narrowing its course of study, but by enlarging the scope of its training by establishing additional chairs. This requirs additional endowment; but among its graduates are men of influence and money. Although the University is a state institution there are many ways in which this influence and money could be used in behalf of their alma mater by graduates who may be able to trace much of their success in life to her influence. The University has recently been the subject of some very sharp criticism. If she is called upon to give reasons why she should be permitted to exist her graduates ought to answer.

The Halifax Ladies' College, under the Principalship of Miss Leach, has been enjoying an extraordinary run of popularity during the past year. Rev. Robert Laing, the real founder of the institution, has just been appointed Secretary by the Directors. He has accordingly resigned the pastorate of one of the largest churches in Halifax and accepted the position. As a man with power in addressing the public, as a scholar and as an educationist, he has probably no superior in these provinces. The Halifax Ladies' College has already taken its position as one of the leading institutions of the country.

Kings College is making great preparations for the celebration of its centenary about the end of June. There will be several ecclesiastical dignitaries present from the United States and elsewhere. A better attendance of students is anticipated after this event.

Dalhousie College is resting in the quietness of the summer vacation. Periodically one of the rooms is lit up with the eloquent orations and discussions of a club of young Halifax lawyers, who are disporting themselves in the forensic gymnasium.

Dalhousie with all its funds for special purposes is reported as going behind to the tune of $2,000 a year. This is due to the lack of an adequate fund for the general expenses. $50,000 must be raised to meet the emergency.

Steps are being taken to form a more complete Natural History Museum in connection with the institution.

Acadia College has just closed one of its most prosperous sessions, nineteen B. A.'s having been capped. Horton Academy is raising the standard of its work under the new Principal; so that Acadia will henceforward have from that feeder material of a more advanced character to begin with. There are seventy-five now enrolled in this Academy.

The closing exercises at the Mt. Allison Institution took place the last week in May, and as usual drew together a large number of its enthusiastic friends, who at each annual convocation assemble in increasingly large numbers. The work of the year has been such as to beget a still greater confidence in the administration of affairs under its able President, Dr. Inch, and to show that Mt. Allison is year by year keeping pace with educational growth, and increasing its appliances for the higher education.

The closing exercises of the New Brunswick Normal School took place on Friday, June 6th, and were of an interesting character. The excellent quality of the instruction given, was shown in the lessons conducted by the teachers of the different departments. Addresses in commendation of the important work of the school were delivered by several of the visitors present, among whom were His Honor Lieutenant-Governor Tilley, the Chief Superintendent of Education, and the Attorney General.

The public schools in New Brunswick close on the 30th of June for the summer vacation. Those in Nova Scotia a fortnight later. In New Brunswick, those teachers who attend the Educational Institute at Moncton, will close their schools on Wednesday, 25th of June. Full particulars of this meeting of the Institute will be found elsewhere in this issue. It promises to be an interesting session, and the ease with which Moncton is reached from all sections of the Province should draw together one of the largest provincial gatherings of teachers that has ever assembled here.

In Nova Scotia the Educational Association will meet this year at Halifax during the last week of the year. Although the winter season is not so pleasant for travelling it is more favorable in other respects than the summer for such an educational gathering. Those who attend will come with more vigor from the shorter term's work, the impressions received will be less likely to fade from the mind in the brief period before a return to work, and the longer school term between winter and summer vacations will give more opportunity to the teacher to put in practice what has been gained in the council of teachers.

The Nova Scotia Summer School of Science this year will meet at Parrsboro, July 21st, and continue in session two weeks. The promoters of this summer school have aroused and maintained an interest in it, which grows from year to year. This is the result of a very thorough organization, a careful administration on the part of its executive, and an unbounded enthusiasm on the part of both teachers and students in the subjects of the course. The approaching session promises to be attended by greater numbers than any previous one.

Summer schools and educational gatherings in other places will attract a few of our teachers. Very many will spend the vacation quietly and devote their leisure to the gaining of fresh strength for next year's work. Earnest teachers, and those who are sincerely desirous of the welfare of those committed to their charge, will make their vacation, whether it consists of work or play, a recreation indeed—devoting it to the invigoration of mind and body, and gaining, by communion with nature and with other minds, new ideas and purposes.

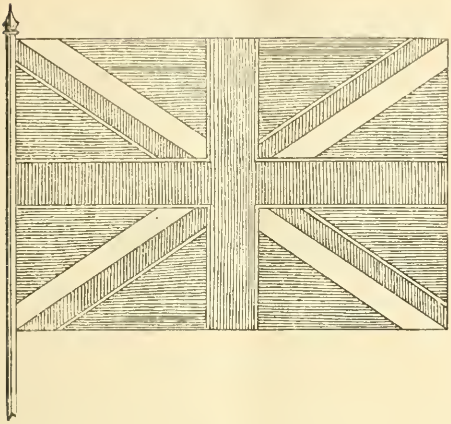
SALARIES OF TEACHERS.

While on the whole the average salary of our teachers is not rising, we are glad to notice that when teachers excel in their profession there is an evident disposition on the part of intelligent communities to acknowledge such merit by larger pecuniary remuneration than ever before given in the history of the provinces. Intelligent men know the value of a superior teacher. But among our teachers are some honest ones who have no genius for teaching, and some whose hearts are in the work only so far as is necessary to earn a little money to make a start in some other business. These not only deservedly receive small remuneration, but their presence also tends to reduce the rate of remuneration of deserving teachers. These may be known by their apathy in any educational effort which does not appear to be likely to increase their salary for the present, or perhaps for the next term. It is not the profession of their choice—merely a make-shift, or a necessity. He who discovers an expedient method of eliminating such individuals from the profession will be the greatest benefactor of his time from an educational point of view.

SALARIES OF INSPECTORS.

The development of the County Academies and High Schools of Nova Scotia specially distinguish the last few years of our history. We might also add, the stimulation of technical education, by the encouragement of agricultural and mining instruction. The inspector remains yet, however, one of the greatest potencies in the inspiration of both teachers and trustees, as well as being necessary as a supervisor and a statistician. But growth in some departments and the ligature in others may produce a very deformed organic whole. We have referred to the growing appreciation of teachers of special merit in some of our best schools of to-day. Several teachers in more than one county receive higher salaries than are paid inspectors. Now it is admitted on all hands that the inspector should be the first teacher in his county. But should a vacancy in the inspectorship of some counties occur to-day, the best teachers would feel that that appointment would be no promotion, on account the low salary fixed in the olden time. Now the duties of the Inspector are more important than the duties of a teacher; and his influence should be enormously greater, and they are. Yet we find learned, skilful, energetic men worked nearly off their feet, on salaries which are not at all in keeping with the progress of to-day, not at all in proportion to the requirements of their positions, and not at all compatible with the most efficient discharge of their duties to the public. We have been inspired by no inspector in making this note. We just incidentally noticed that the salaries of skilled teachers have been raising, while those of inspectors being fixed by government have remained *in statu quo*. And we were not long in observing, as any business man at a glance can see, that if an efficient inspector has been appointed he should have an appropriate remuneration, one at least sufficient to enable him to be thoroughly equipped in every respect for the important — extremely important — functions of his position. We have no doubt but that our government will give this suggestion a careful consideration; and giving it a careful consideration we have confidence they will do right, even if our view should not be exactly entertained.

OUR FLAG.



THE UNION JACK.

The winds which press the rolling waves
In phalanx o'er the deep,
And from the Indian palm trees blow
O'er Afric in their sweep,
Until Columbia's mountain pines
Sway on their rocky steep,
    Keep streaming in the endless gale
    O'er cloud-capped peak and distant sail,
    Our meteor flag.—Britannia, Hail!

— *Kaymah.*

TEACHER. When we hoist our flag on the 24th of May, or on the 1st of July, what do we really pay our respects to, when we honor the flag. Is it the cloth or the design?

S. No. Of course not There may be better cloth and more beautiful designs which we never treat with similar respect.

T. Your argument is good. What do we really pay our respects to, then?

S. To what the flag represents.

T. What does the flag represent? The Queen, is it?

S. No. The flag was before the Queen was.

T. The government then? There was no flag before there was some kind of government.

S. I think it represents more than the government, although I can't say exactly what it is. We never think about the government when we cheer for the flag.

T. What do you think about, then, when you cheer for the flag?

S. Of the great things done by people who carried it as we do.

T. Very good. You have a very clear idea. The flag represents the people and what they did. Now what have the people done?

S. They won great victories over other peoples.

ANOTHER S. When they conquered other people they left them better off than they found them.

ANOTHER S. They made good laws.

ANOTHER S. They tried to become good and noble, to put down what was wrong and to help others to be good and noble.

T. Yes. A great many of them have been distinguished in that way; what more?

JACK The people have also made their own government, so that the flag represents the government, the people, and what the people have done.

T. Capital, Jack. Your idea is quite comprehensive. What is our flag called?

S. The British flag.

ANOTHER S. The British Ensign.

ANOTHER S. The Union Jack.

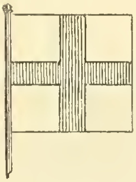
ANOTHER S, The Meteor flag of England.

JACK. The flag that braved a thousand years the battle and the breeze.

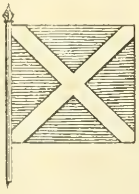
T. Well, you are right and wrong. We shall see how. While England's flag has braved the battle and the breeze for a thousand years, the *Union Jack* figured above has been in existence only eighty-nine years to date.

S. How is that?

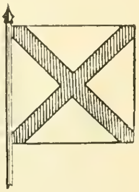
T. The Union Jack is not England's flag any more than it is that of Scotland or Ireland. The English patron Saint was St. George; and St. George's cross was a red vertical and horizontally armed cross on a white banner. St Andrew's cross was a white diagonally armed cross on a blue banner; St. Andrew was the patron Saint of Scotland. The patron Saint of Ireland was St Patrick, whose cross is a diagonally armed red one on a white banner, And the English, Scotch and Irish, were once separate kingdoms, with their own banners. Here they are.



ENGLISH.



SCOTTISH.



IRISH.

In heraldry vertical shading lines represent red, horizontal shading lines blue, and the absence of any marking white.

T. When were England and Scotland united?

S. In 1603.

T. Well, it is then the first Union Jack came into existence. It was a Union of the banners of St. George and St. Andrew.

S. What was it like?

T. A blue banner with the St. Andrew's cross covered with the red cross of St. George. When was Ireland united to England and Scotland.

S. In 1801.

T. Well, on that occasion the red cross of St. Patrick was added to the Union Jack; and so that it would not cover out of sight the white cross of Scotland, the Scottish and Irish arms of the cross are matched alternately against each other.

S. Then the Union Jack is called the *Union* because it is a union of the English, Scottish, and Irish crosses, and this represents the united three Kingdoms.

JACK. And the *Jack*, because it was the English Jack, the sailor, who won for it the most glory at first.

T. Very good.

S. It is not the English flag then?

T. No more than it is Scottish or Irish flag The English cross is in front; but the whole blue field as well as the white cross is Scottish. It is the Scottish banner plus the cross of St. George and St. Patrick. It is now the British flag—the flag of the world-wide Empire.

S. What is the British Ensign?

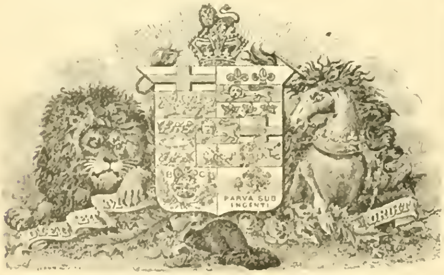
T. It is a red flag with the *Union* in the upper corner next the flag staff. The part most distant from the staff is called the fly. This flag is also known as the British Merchant Flag The Naval Reserve Flag has a blue fly. The Man-of-War flag has a white fly divided by a St. George's cross the upper inner angle of which is filled with the Union. The flag of the Admiral of the Fleet is simply the Union; of the Lord Lieutenant of Ireland, a union with a harp in the centre. There are many modifications of the flags to indicate particular kinds of service; but we are concerned only with the Union Jack and the Ensign.

S. Isn't there a modification of the Ensign which indicates the Dominion of Canada?

T. So there is. And as it is so near Doninion Day, I must let you know it. The Dominion Flag is simply the British Ensign with the Canadian Coat of Arms on the fly.

S. And what is the Canadian Coat of Arms?

T. Here it is, on the shield between the supporters, the Lion and the Unicorn.



Canada is made up of its provinces; and its Coat of Arms consists of those provinces "quartered," as the heraldic term is, on the one shield.

S. The Canadian Flag, then, represents the Empire generally and each Province in particular. Which of them are the Arms of Nova Scotia?

T. The fish with two thistles above and one below in the centre of the shield.

New Brunswick's is on the left. What is it?

S. A ship with a lion above it.

T. Prince Edward Island's at the bottom on the right?

S. The little tree under the great one.

T. British Columbia's to the left ——?

S. The wreath and crown.

T. Manitoba's to the right of Nova Scotia's——?

S. The buffalo and red cross.

T. Quebec's, the upper right corner——?

S. The three maple leaves, lion and two fleur-de-lis.

T. Ontario's on the left side——?

S. The three maple leaves and red cross.

T. What is the tendency of civilization—to break up countries into small independent states, or to unite small states into larger ones?

S. Union is the tendency.

T. What advantage is there, generally speaking, in union under one government?

S. All matters in the united countries will be settled by law; while if they were separate they might be settled by war.

T. Which is the most widely spread empire in the world?

S. The British Empire.

T. Is it united into one.

S. Yes, but not so closely as smaller states.

T. Would it be any advantage if all the world were united in one great state.

S. I think it would. They would settle matters then by their laws, and there would be, perhaps, no possibility of war; and there might be fairer trade.

T. Perhaps. What orders of goverments subordinate to each other are covered by our flag, beginning with the smallest.

S. The School Section Corporation, then the County Municipality, then the Province, then the Dominion, then the Imperial Government.

T. What might come next?

S. Perhaps Tennyson's federation of the world and parliament of man.

T. Well, the Union Jack has evidently the lead in this great work of union. Hurrah for the Union Jack.

ON last Tuesday, at Ottawa, at the opening meeting of the Royal Society, Rev. Principal Grant delivered an address, taking Australian Confederation for his theme. In the course of this address he said:

> "Referring to the difficulties the Australians would have to overcome in effecting union, he pointed out that they had one advantage over us. No one of them doubted that Australia had a future. There was no party there that corresponded to our repealers, nationalists, or annexationists. "We do not know," he said, "whether those who have lost faith or who never had faith in a great Canadian commonwealth are many or few; but whether few or many they are our supreme difficulty. What of this or any other difficulty, however? Every nation has difficulties of its own, and in struggling against and overcoming these, men are tested and men are made."—*Herald* (Halifax.)

The Rev. Principal, who has been elected to the Presidency of the Royal Society, ought to be satisfied with the progress of unity in Nova Scotia; for we have just seen something better than a "repeal" government destroyed within the last month. We have seen it converted and endorsed by the country, and especially by the so-called "repeal" party, as a "non-repeal" government. This means a unanimous abandonment of such an agitation for the future.

The Late Superintendent Montgomery.

Died at Charlottetown on 14th May, Mr. Donald Montgomery, Superintendent of Education for Prince Edward Island. Never of robust health he had, during the last few years, suffered from an affection of the heart, but not so seriously as to interfere with the discharge of his duties. About the first of May he was prostrated by an acute attack, and though, at times, it was hoped that he would recover, temporarily at any rate, he died after a short but painful illness of a fortnight.

Mr. Montgomery was born at Valleyfield, P. E. I., about forty-five years ago. After teaching for some time he entered the Prince of Wales College and there prosecuted his studies for three years. As a student he was remarkable for his devotion to his work. He was able, assiduous, and painstaking. Having selected teaching as his life work he devoted himself heart and soul to it, and resolutely determined to equip himself in the best manner possible for the career of his choice. After completing his course with distinction he was appointed to the Grammar School at Harrington, and in the following year, a vacancy having occurred in the Normal School, he was selected as head-master. As a teacher he realized the expectations that were formed of him when a student. He was careful, diligent, methodical and intelligent.

Not having been appointed to the Normal School on the passing of the Education Act of 1876, Mr. Montgomery spent part of two years in law studies at Montreal, and when a vacancy occurred in the representation of the fourth district of Queen's County he was returned as its representative. In 1879, he was appointed Superintendent of Education. During these eleven years he has discharged his duties with tact, judgment, and precision, and as an executive officer has left nothing to be desired. Prince Edward Island, during his incumbency, has been singularly free from disputes between teachers, trustees and people, and elementary education has, upon the whole, made satisfactory progress.

Astronomical Notes.

MARS.

"Mars is too far off, too faint, and too near the Sun. . . . . But just wait until next June."

So said the REVIEW's Astronomical Notes in June, 1889. "Next June" has come, and already many a star-gazer has "pointed to Mars, as he glowed like a ruddy shield on the ——," not "on the Lion's breast," as he did some thirty years ago, when Maud's ghost pointed him out, but on the Scorpion's back.

There is a planet that has been, for the last three months and more, glowing somewhat like a ruddy shield on or near the Lion's breast, but that is not Mars, it is Saturn. And a fine pair he and Regulus have made during these months. With their contrasted colors of orange and blue, they have afforded to the naked eye of the star-gazer much the same kind of sight that a double star like Beta Cygni presents in the telescope.

Last June Mars was "too far off, too faint and too near the Sun," so near the Sun (this refers to his *apparent* distance) that on the 15th of that month he crossed the meridian only three minutes after the Sun and less than a degree from where the Sun crossed it. So faint, that it would have been easier to see the Pole-star in daylight than to have seen him. And so far off that there were two hundred and forty million miles between him and us. But on the 15th of this June his distance is only forty-six millions; his brightness—well that speaks for itself; and his apparent distance from the Sun is nearly as great as it can be. It was as great as it can be—that is 180°—at the end of May, the very time at which, according to some of our local almanacs, Mars was "too near the Sun to be seen"

With the help of the map in the May REVIEW it will be easy for the star-gazer to follow Mars in his motion among the stars. There may be, among the star-gazing readers of the REVIEW, some who have never yet observed this form of celestial motion. If so, and if you are one of them, go and observe it now, and then you will really know for the first time in your life why a planet was called a planet.

On the evening of June 12th you will find Mars half a degree south of Delta Scorpii—the six-point star close to his track on the map. Next evening he will be a little west of that, the evening after a little farther west, and so on until the beginning of July. He will then be more than three degrees west of Delta. During the first week of July there will be very little change in his position. When next a decided change is noticed, he will be found to be moving east—back toward Delta—but farther south than when his motion was retrograde. On July 26th he will be again directly south of Delta, but from two to three times as far from it as he was on June 12th. A fortnight later, on August 9th, he will be due north of Sigma Scorpii, that third magnitude star to the right of Antares. The distance between Mars and Sigma will be nearly a degree. At the same time you will find on the other side of Mars and half a degree away, the fifth magnitude star 19 Scorpii. On August 14th will occur the conjunction between Mars and Antares, the third one this year, and the nearest of the three. The distance will be about a degree and a half.

Less than a tenth of a degree to the north of Mars you will find at the same time another fifth magnitude star, 22 Scorpii.

Before the end of August Mars will have passed out of the region represented on our map. On the 26th of that month he will be just three degrees south of where he was on April 22nd, when he began retrograding. By that time his opposition season will be well over; but we shall have him as evening star until the end of July 1891, and may easily see him any clear evening until about the beginning of next June. Between the time of his leaving Scorpius in August next, and the time when we shall be getting our last look at him as evening star, next May or June, he will travel through the constellations Ophiuchus, Sagittarius, Capricornus, Aquarius, Pisces, Aries, Taurus.

In the middle of June 1890 he is about a degree from Delta Scorpii, in the middle of June 1891 he will be about a degree from Epsilon Geminorum. That is quite a lot of travelling in a year for even a planet. Round the shortest way it is a matter of 140 degrees, but the planets are not allowed to go that far that way. Round the way they have to go, this is a distance of 220 degrees. Uranus is a planet as Mars is, but it takes him fifty years to travel over that much of the sky. A star is not a planet, but even the "fixed" stars are in motion—"proper motion" it is called. There is one of them, up near the Big Dipper, which has so much of this motion that it has been named the Runaway Star. With such a name we might expect something extraordinary in the travelling line, but it would take the Runaway Star more than 100,000 years to change its position in the heavens as much as Mars will do between this June and next.

While on his travels Mars meets with all the usual adventures. He passes the stars along his route sometimes veay near them and sometimes right over them. Last March he came very near running over Beta Scorpii. He also passes planets that are slower than himself, and is passed by those that are faster. In the middle of November next he will pass Jupiter, at the distance of a degree. The two planets will then be in Capricornus and for some days the pair will be the most conspicuous object in the evening sky.

The moon moves faster in the heavens than Mars and therefore passes him. She is nearer than he is and sometimes passes between him and us and occults him. It would be a fine sight to have an occultation of Mars when he is as big and bright as he is now.

There has been one occultation of him already this year—on April 9th—but it was chiefly for the benefit of the Sandwich Islands and thereabouts. There will be another on October 20th, but to see it well one ought to be out in the Indian Ocean near Kerguelen Island. Next year Mars will again be occulted twice, but neither of them will be visible here. But on July 11th, 1892, there will be one which will be visible here, and Mars will then be bigger and brighter then he has been this year even when at his best. If we happen to live until then and can manage to have a clear sky, we shall see the best occultation provided for this part of the earth since that of Jupiter last September—and that was spoiled to us by fog, or clouds, or smoke.

The wanderings of Mars among the stars and his meetings with the moon, the other planets, and the stars, during these wanderings—these are matters that the star-gazer can see for himself, and need not take merely at second-hand from his books. That is why these matters are chiefly dwelt on here. For information on other matters of interest connected with Mars—his real motion, his orbit, his distance, his size, his moons; his physics, and his chemistry, and his geology; his continents, and ice-caps, and seas, and canals; his days and months, and seasons, and years; his astromoners, and engineers, and farmers, and all the rest of the Marticoli, those who cut the canals and planted the trees along them, and those who have been so long vainly signalling to us stupid terrestrials by means of huge beacon-lights which at this distance and in our best telescopes look like mere luminous points—for all these things the star-gazer must go to books and magazine articles, and must take whatsoever he does take of them at second-hand.

Another fact that any one may learn by merely using his eyes, is that Mars varies in brightness.

Just now he is unusually bright. This is because he is unusually near. At present he is the nearest of all the heavenly bodies, except our moon. He has not been so near since November 1879, and will not be as near again until June 1892. In July and August 1892, he will be nearer and brighter than he is now.

If the orbit of Mars was a circle instead of an ellipse we would have him at his brightest once in every period of two years and two months; and at his brightest he would always be equally bright, and that would be as bright as he was in the middle of May this year. He would be brightest when in "opposition"—that is, when seen by us in the part of the sky *opposite* to the part where the sun is. When so situated, the earth is between him and the sun, and his distance from us is only the *difference* between his distance from the sun and ours. When not in "opposition," his distance from the earth is of course greater than this and he is then less bright.

All this is true of what really happens, except that when in opposition and brightest for the current season, he is not always equally bright. His orbit is an ellipse not a circle, therefore his distance from the sun is not always the same. Neither is the distance of the earth from the sun always the same. Therefore the difference of these distances is not always the same. And this difference is the distance between the earth and Mars at opposition when he is brightest. Therefore his brightest is not always equally bright. His mean opposition brightness is what he showed in the middle of May. Let us use this as his standard brightness, and call it 100. If his orbit was circular his brightness at opposition would always be this 100. But, as things are, his opposition brightness may be as low as 50, and as high as 240. When at the best this year—June 7th,—it was 120. At the last opposition in April 1888, it was less than 70. At the next one in August 1892, it will be 230. On this same scale, his brightness in the middle of each month of the present year is as follows:—January 9, February 9, March 25, April 50, May 100, June 117, July 80, August 50, September 33, October 23, November 17, December 13. Last summer and Autumn, when Mars was on the farther side of the sun, his brightness was less than 4 And so beween August 1889 and August 1892 his brightness varies from 4 to 230.

Expressed in terms of star-"Magnitude," the brightness of Mars varies from that of a second magnitude star, like the Pole star, to that of one whose magnitude is *minus* 2, that is, one which is three "magnitudes" brighter than a standard star of the first magnitude like Altair, or Aldebaran, or Antares. There is no star as bright as that (Sirius is about *minus* 1¼) but it is about the brightness of Jupiter at mean opposition.

A. CAMERON.

For the Review.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

Seventh Paper.

A prominent feature in Tonic Sol-fa work has been the preparing pupils for the various certificates issued by the Tonic Sol-fa College, London, England. The preparation for these certificates secures systematic teaching, and is a great stimulus to teacher and pupils. The pupil who passes the requirements for the lowest or Junior Certificate, has made a fair beginning of his musical education, and yet this certificate is quite within the reach of the average pupil of nine or ten years who has received a careful course of twenty lessons of say forty minutes each.

Requirements for the Junior Certificate.

1. Bring on separate slips of paper the names of three tunes and sol-fa from memory while pointing it on the modulator one of these tunes chosen by lot.

These or similar tunes may be learned for this requirement: the pupil should have a Home Modulator.

Key G—*Moravia.*

{ :D | d :s | m :d | d :m | r
{ :M | s :f | m : r | d :— | —
{ :M | s :f | m :d | d :m | r
{ :M | s :f | m :r | d :— | —‖

Key E*b*—*Innocents.*

{ | M :–.f | s d^1 | t :l | s :—
{ | D :–.r | m :s | f :m | r :—
{ | M :–.f | s :d^1 | t :l | s :—
{ | D :–.r | m :f | m :r | d:—‖

Key G—*Harts.*

{ | S$_1$:s$_1$ | d :d | r :r | m :—
{ | D :d | f :m.r | d :m | r :—
{ | S : | m :m | f :f | r :—
{ | M :f | s :f | m :r | d :—‖

2. Sing on one tone to *laa*, or any other syllable, in perfectly correct time, any one of Nos. 1 to 9 of the "Elementary Rythms" taken by lot. Two attempts allowed. The pupil may *taatai* the exercise in place of the first attempt.

These nine rythms have been given as time exercises in former papers.

3. Sol-fa from the examiner's pointing on the modulator a voluntary, moving at the rate of M.60, and consisting of at least twenty-four tones, including leaps to any of the tones of the scale, but neither transition nor the minor mode.

4. Sol-fa at first sight from the Tonic Sol-fa Notation a phrase of eight notes, or else the air of a "Single Chant," which has no tones out of the common major scale, and no tones shorter than a pulse.

5. The tones of a *Doh* chord being given by the examiner, tell by ear the Sol-fa name of any one tone of the scale he may sing to *laa*, or play on some instrument.

The Standard Scale.

While we can pitch *doh* high or low when we wish to sing a particular tune, we require to pitch the *doh* to bring the tune within the compass of the voice. The pitch of a tune, then, is shown by reference to the standard scale. For it a tone is taken high in a man's voice and low in a woman's voice. This tone is produced by 256 vibrations per second. Tuning-forks for singing give the higher octave of this note produced by 512 vibrations. We name this scale thus:

| d^1 :— | t :l | s :f | m :r | d:—
| C^1 | B A | G F | E D | C

The order of the names descending is easily remembered. C^1, then the letters of *bag* and *fed* bring us down to C. M.60, M.45, mean Metronome 60, Metronome 45, which indicates that the rate of movement is sixty pulses per minute or forty-five pulses per minute. A metronome is an instrument on the same principle as the pendulum with moveable bob, which will give the number of vibrations per minute desired.

Songs should be introduced as soon as possible. The singing of musical exercises is only a means towards the singing of songs. It will be well for the teacher to know by heart many good songs adapted to the capacity of his pupils. For the teacher to sing over a good tune with interesting words will enliven the pupils when dull and will develope a taste for music. The singing of such a song might be a reward for any lesson well done. The songs taught to the pupils, however, should not embrace any difficulties that have not been mastered in the exercises, otherwise the tune must be taught by ear, which is a waste of time and hinders the progress in the proper and intelligent singing from notes.

School songs should therefore be carefully graded, and the musical and intellectual capacity of the class must guide the choice. The teaching of difficult classical music, or anything beyond the pupils, can not be defended. Young children should always be learning pretty songs which they can remember and can sing in their play and for the pleasure of those at home. These songs should be easily within the compass of their voices, and should inculcate duty and call attention to the beauties of nature. Older pupils may study more elaborate pieces, but not too difficult, joined to poetry not too deep but worth remembering. JAS. ANDERSON.

Mr. A. can post Home Modulators for 16 cents per dozen.

For the REVIEW.]

Hints for Country Teachers.

To a young teacher, who is just entering upon her duties in an ordinary country school, the prospect is usually discouraging. The house will perhaps be small, the furniture will consist of a number of rough desks and seats, guiltless of paint, the teacher's desk barely long enough to hold the register, and which is already nearly full of copy books, pens, ink, and numerous other things, leaving the teacher quite at a loss as to where she will stow her own books. Then to complete the picture, a map or two, and a blackboard, much too small to be of very much benefit.

Now in face of these drawbacks, is it to be greatly wondered at, that a teacher should gradually lose courage and simply *hear* lessons?

I think there are many who resolve at the outset to "put in the time," thinking they will be more fortunate next term. Now this, of course, is not as it should be. No matter how uncongenial the surroundings may be, that does *not* excuse the teacher for not performing his or her duty.

Much may be done by the teacher to make up for the lack of necessary apparatus. If there are no maps, or, if there should be an important one missing, the teacher can draw it on the blackboard, even though it should occupy the greater part of the blackboard, leaving little room for other work. If colored crayons be used to mark the counties, boundaries, etc., it will enable the pupils to reproduce them more correctly.

Country teachers have many advantages which some of them do not seem to appreciate. I refer to the various flowers and forest trees of which they may easily obtain specimens.

Very little is known about forest trees—that is, by most country pupils. They see them growing everywhere, and are so accustomed to the sight, that they really do not seem to notice the difference between the hard-wood and soft-wood trees, until it is pointed out to them.

If any teacher wishes to secure the attention of the pupils while endeavouring to give lessons on forest trees of New Brunswick, I may say that I have always found the following method quite successful:

Tell the pupils you intend giving them a few lessons on forest trees, and ask them to bring you specimens of, say four or five different kinds of trees. Small pieces are best, just large enough to show the grain and color of the wood, also if possible the bark. The children will be delighted, and will bring specimens, ranging from apple tree to oak. if they can get them. Then select one from the number for the first lesson; some familiar tree as maple, for example. Let each pupil examine it, and then ask what they have noticed in regard to color, bark, etc., (I usually compare hardwoods with softwoods. Pine presents a striking contrast to maple.) Tell the children the uses of the maple tree, how sap is obtained from it, which can be made into sugar, also the various uses to which the wood is applied, and describe its shape, height, its foliage, and where it grows most abundantly. Of course all this cannot be accomplished in one lesson. The lesson should not exceed fifteen minutes, but you will find on beginning the second lesson, that the children have not forgotten the preceding one. Before describing another tree to the class, review the ground you have gone over — the answers will in some cases be startling, but if the teacher carefully corrects mistakes, the class will be led to see their errors, and will be careful in that respect in future.

These lessons will help to train the observing powers of pupils and perhaps awaken in their minds more admiration for the noble forests which abound in "our own New Brunswick." CIE-CIE.

For the REVIEW.]

Educational Institute of New Brunswick.

As advertised elsewhere in this number of the REVIEW, the Educational Institute of New Brunswick will be convened this year in Moncton. Always heretofore the meetings have been held either in Fredericton or St. John, and five-sixths of the members have come from the western half of the Province. It is hoped that there will be a large representation this summer from the eastern and northern counties,—while the teachers in the west and south will also gather in undiminished numbers at the metropolis of "the noble county of Westmorland."

According to the regulation, teachers are allowed to take the last three teaching days in June for attendance at the Provincial Institute, and the Provincial and County fund drafts are not diminished in the case of those reported as present at all the sessions. On this occasion, the Saturday will be taken for one of the teaching days, and Monday, the 30th of June, will be substituted for it as a holiday

The first session will be held in the vestry of the Methodist Church, on Thursday, commencing at two o'clock, eastern standard time,—when the enrolment of members will be made, the reports of the Executive and Special committees will be received, and the usual elections will take place.

On that evening there will be a public meeting in the Opera House, to be addressed by Mayor Sumner, of Moncton (who will extend a welcome to the Institute), W. J. Robinson, Esq., Chairman of the Board of School Trustees of Moncton, Dr. Inch of Mt. Allison College, Rev. W. Hinson, Rev. G. M. Campbell, Rev. J. M. Robinson, and others.

At this time also a short address will be given on behalf of the Provincial W. C. T. U. Music will be provided at this and other sessions.

On Friday and Saturday the following papers will be read and discussed:

"Patriotism—How can it be developed in Common Schools?" by Inspector Bridges.

"English in Advanced and High Schools," by Mr. J. G. A. Belyea, B. A., of Shediac.

"A Scheme for Promoting Pupils in Graded Schools where there is no Local Superintendent," by Mr. F. O. Sullivan, of St. Stephen.

"Hints on the Teaching of Geography," by Mr. John March, M. A., of St. John.

"An Illustrative Lesson in Natural Science," by Mr. John Brittain, of the Provincial Normal School.

In consequence of the ill health of the gentleman who was to have addressed the Institute on the subject of "Professional Progress," the Secretary has consented to read a paper, if required, to occupy the time.

Gentlemen have been invited to open the discussion following the several papers.

The Executive Committee, at their January meeting, decided to propose that one afternoon be devoted to an excursion, perhaps to Shediac; but no further action has been taken in the matter, and it may be left to the consideration of the Institute.

By request of the Executive Committee of the "Alumni and Alumnæ Association of the Provincial Normal School," the Institute will assemble on Saturday morning a half hour later than usual, in order to allow time for the annual meeting of the Association.

Travelling arrangements have been made as follows. The Intercolonial Railway, Buctouche and Moncton Railway, N. B. and P. E. I. Railway, Chatham Branch, and Caraquet Railway will give free return tickets to members on presentation of certificates of attendance. These return tickets will be procured before *returning* over the roads named.

Members who travel by the N. B. Railway, or the Northern & Western (Canada Eastern Railway), must ask at the station where they take the train, for *excursion return tickets* for the Educational Institute, to St. John, Fredericton or Chatham Junction, as the case may be, for which they will pay one first-class fare. These may be purchased on the 25th, or 26th of June, (for the N. & W. Railway on the 24th also). Certificates of attendance must be shown also for the return journey on the last named road. The arrangement on the Shore Line will probably be the same as on the N. & W. Railway. The Elgin & Havelock Railway, gives teachers the benefit of free return fare.

The Union Line of Steamers, and the Steamers "May Queen" and "Arbutus" will return members free on presentation of the usual certificate of attendance.

The limit of time for which the arrangement is good is July 3rd,—and on the N. & W. Railway, July 5th.

No answers have as yet been received from the managers of other railways and steamboats, to whom letters were mailed on the 18th of May.

HERBERT C. CREED, *Secretary.*
Fredericton, May 31st, 1890.

Vacation, Ambition, and Conscience.

"How shall we spend vacation?" becomes the important question as the school term draws to its close. Zealous school people are saying, "Go to a good summer school." Doctors and friends are urging, "Forget all about school and recruit." The tired but conscientious teacher who spent last vacation in a rowboat, under a swaying roof of leaves along the margin of some lake is asking, "Did I do right?"

Vacation is our free time for truth-seeking. We may seek it in thousands of pleasant and diverting ways, and the more we find of it, the more we shall want to take it home to our class-rooms. There is scarcely any way of spending vacation that will not make it a benefit to a teacher who loves her pupils. To spend two or three weeks at a good summer school is not a weariness of the spirit to a teacher who feels the greatness of her responsibilities, and earnestly desires to discharge them better year by year. She is sure to catch and impart some inspiration in meeting others of equal enthusiasm with her own, and from widely different localities—sure to get and to give some gleam of truth. The afterpart is to take this new bit of truth away to realms of quietude and rest, and nurse it, that something may come of it. Man is a ruminating animal, and, for the best assimilation of thought, he must lie down in the shade and chew the mental cud. To exchange the ten months' role of teacher for the three weeks' role of pupil is in itself a rest for most minds. If the studies taken up are not too laborious, the teacher finds that "change of work is play." Then, when the summer school closes, there are still several weeks for absolute rest, the pleasure of which is enhanced by the consciousness of advantages enjoyed at the proper and only possible time.—*N. Y. School Journal.*

Tact in Governing.

Tact does not treat an entire class to a five-minute scold simply because one pupil has not done his work. When one boy is noisy or frivolous, tact does not attract the attention of a dozen industrious ones by a rasping reproof. Tact, having learned that silence is the surest cure for disorder, fixes his eye on the culprit and quietly awaits for him. During change of classes, or at any other odd moments, tact never lets go the reins, for he well knows the value of an ounce of prevention. Tact has few rules, but those he has strictly enforced. Tact makes conviction the foundation of obedience, but strengthens obedience by authority. "Underneath his silken glove there rests the hand of steel." Tact studies the good points of his pupils, and always aims to touch the lever that puts into operation the best that is in a boy; and as carefully avoids all necessary conflict with the bad that may be in him. Tact always does himself as much as he demands of his pupils—puts neat work on the blackboard, never lounges, always speaks distinctly. Tact accords the same respect to his pupil's rights as he expects for his own. Tact is constantly increasing his knowledge of the subjects taught and improving his methods of presenting them. He thus brings live blood into every recitation, and does much towards removing the dull monotony that is likely to accompany routine work. Tact puts himself in good humor by taking note that the great body of his boys and girls are earnest, studious, and well disposed. This keeps him from wasting nerve and patience in fretting over the one dull, lazy, or refactory boy that is pretty sure to be found in every school.—*School News.*

No summer school has much value that does not require study. Teachers are not sponges, absorbing knowledge without personal effort. Hearing is one thing, thinking something else. Thinking requires effort, and effort means work. No teacher can go to a summer school and have a "good time" and nothing more.—*School Journal.*

Be punctual. You cannot enforce punctuality on others unless you set an example of it yourself.

Spread of the English Language.

At the opening of the present century there were, in round figures, 20,500,000 people who spoke the English language. They were chiefly in England. We were only a few millions in America. The French speaking people at that time numbered about 31,500,000, and the Germans exceeded 30,000,000. The Russian tongue was spoken by nearly 31,000,000 and the Spanish by more than 56,000,000.

The French speech is now used by 50,000,000 people, the German by about 70,000,000, the Spanish by somewhat more than 40,000,000, the Russian by about 70,000,000, the Italian by about 30,000,000, and the Portuguese by perhaps 13,000,000. The English language has enormously outgrown its competitors. It is used by nearly twice as many people as any one of the others, and its relative growth is sure to continue.

North America alone will soon have 100,000,000 English speaking people. There are 40,000,000 in Great Britain and Ireland. Australia will, a generation hence, have as many English people as England now has.

A Few Misused Words.

ALLUDE to, vulgarism for *refer to*, or *mention; e. g.* "the letter you allude to" though you have alluded to nothing, but have told your story straightforwardly, without hint or innuendo of any kind.

ALONE, for *only*, as, "I am not alone bound by honor."

AMONG, as: "He was there among the rest," for "was in the company," or "was with the rest."

AS, for (I.) *so* is almost universal. The rule is that the double *as* should be employed only when there is direct comparison. The most prevalent misuse is in connection with *soon*; (II.) for *that*, as: "I don't know as they do."

BE, means solely state, existence; but of all vulgarisms the most common is to use it to indicate motion; and, as a verb of motion naturally takes to after it, the confusion about the proper use of *be* induces a corresponding misuse of *to*, where no idea of motion is intended to be conveyed. "I have been to New York" is in no case right, but it is used in two senses: (1) "I was in New York; (2) "I went (or have gone) to New York." Many persons who do not say, "I was to Boston," find "I was *up* (or *down*) to Boston," unobjectionable; and others, who would not say, "I shall be to the theatre this evening," invariably say, "I have been to church this morning." "Pretty as she can be" is used as an emphatic phrase, whereas we are all of us as pretty as we can be; it is not owing to man's intention or carelessness that he is ugly.

Benefit. There prevails an idea that the verb to benefit, in forming its past participle. doubles its final letter, giving rise to the curious-looking word *benefitted*. The fact is that the doubling takes place only in a syllable on which the accent is laid, and the purpose of it is to ensure the right pronunciation.

But. (1) We may say that a man is "old but vigorous," because vigor united with age is something unexpected; but we have no right to say, "old but respectable;" (2) "I do not doubt but that he will come." The *but* is wholly unnecessary, and a vulgarism.

Can, for *may*. A mistress will say to a servant, "You can go out," meaning to give her permission to go out, the proper word for which is *may*. There is no question whether the girl *could* go out, *i. e.*, had the ability to do so.

Catch, for *reach*, as: Catch a car.

Centre, for *middle*, This very simple word comes in for a good deal of maltreatment in our days. It means merely a *point*, never a line; as, "A gangway was left down the centre of the room."

Come off, for *take place*. "The concert will *come off* to-morrow." This vulgarism should never be heard beyond the cock-pit.

Consider, for *deem*. It means to reflect upon, to take into consideration. We *deem* a man honest; we *consider* the question of his honesty. "Do you consider the dispute settled?" will ever be bad English, however generally sanctioned.

The Eye in Teaching.

The eye of the teacher has an influence he cannot over estimate. It is of the utmost importance that he train himself to look the school squarely in the eye, that he so command a view of the school that whenever a child looks up he may meet the eye of the teacher. The place for the teacher, almost invariably, is at his desk with his face to the school as a whole. There is rarely an excuse for the teacher to have his back to any pupil in the room. In doing blackboard work he is tempted to stand with his back to the school but the occasions for this are not numerous.

The object in facing the school is not primarily for the sake of discipline, though it has this for its aim secondarily. It is largely because the eye is the most economical force to use in commanding attention. Attention the teacher must have; he cannot command it by any order or rule laid down. It must be won by the teacher, and it must be won by the exercise of some force. The play of the voice is one of the forces, but this requires energy of mind, expenditure of nerve force. Physical activity may secure it, as may personality in physical sympathy, but these are naturally exhaustive. Keenness of intellect, brightness of wit, may hold the attention, but this is a constant draft in its way. While the teacher needs, by way of variety, all of these resources, that which is most economical is the eye. The teacher can put more life, energy and personality into the eye with less draft upon intellect or nerve force than any other way. It is a study to know how to do it. It is high art to do it. Great skill is required but it pays a hundred fold.—*Ed. Gazette.*

In Geography.

Have pupils mold in sand, clay, or putty, a relief map of North America. Then place the molded map before them for written descriptions. The teacher, alive to the slightest mistake, watches pupils as they talk with their pens, and as we so often have said, never allows a second answer to be written until the first is correct. Questions to be written on the board, or given orally. Pupils must get all their answers from the relief map. Tell me one thing about the coast of North America? What is the difference between the eastern and western coasts? The northern and southern coasts? Which coast has the most indentations? Tell me one thing about the western coast? One about the eastern coast? How many highlands are there in North America? Where are the highlands?—*School Journal.*

Physical Drill for Public Schools.

We quote a portion of the preface by the Supervisor of the Halifax Schools of the above named book which was noticed in the April Review, because it so admirably sums up some facts which all our teachers should know. The importance of the subject and the history of the efforts to do something practical in this department are shortly but clearly outlined in the paragraph.

"Almost every great writer on education has given much prominence to the importance of physical culture, both as a thing desirable in itself, and as a means leading to an end—that end being greater possibilities in intellectual and moral development. Judging by estimates of examiners, even our youngest teachers can discourse eloquently on both headings of the text—"A Sound Mind in a Sound Body;" yet in practice the second heading is very generally ignored even by those who are considered our ablest teachers.

Proper care for the bodies of their pupils is most shamefully neglected by most instructors. The *harmonious development* of the physical powers is seldom thought of. Too often the present or future health of the child is sacrificed for the sake of a display of mental ability, that may, for the time being, increase the reputation of the teacher or gratify the vanity of the short sighted parent.

School calisthenics cannot take the place of or be considered as important as those absorbing out-of door games so in harmony with child nature in the development which they secure, yet calisthenics is an important auxiliary to such agencies as ventilation, light, frequent and judicious changes of study and position, etc., in perserving the highest educational vigour in the class room. All the voluntary muscles are so connected with the brain that its health and growth are very much increased by their systematic exercise.

Resolutions were passed by the N. S. Educational Association in 1885, and by the Halifax School Commissoners in 1888, affirming the necessity of more attention to physical education in schools. Supervisor McKay and R. J. Wilson, Secretary of the School Commissioners, were appointed a committee by the Halifax Board. The result was the preparation of an excellent manual of physical exercises, by Sergeant-Major Bailey.

Examining Slate Work.

A question usually arises about examining slate work, to what extent is it best to examine, and how can it be done without the loss of much time. When the exercise is mere copying, or lists of words, a look at the slate as a whole, with here and there a commendation for neatness, or a correction of prominent mistakes, is sufficient. We have seen two ways of doing this rapidly, which have proved good. Let each child take his slate in both hands and hold it as he would his reader. The teacher can pass quickly up and down the isles and see the work at a glance; at the same time the school presents an orderly appearance. Another way, especially adapted to primary schools, is to have the pupils of one row rise and pass down the right-hand aisle to the teacher, letting her look at the work, then passing around the left-hand side to their respective places, when the next row will rise and proceed in the same way. There need be no confused group, but rather a continuous procession; it also gives the little folks a change of position and motion.—*Popular Education.*

Govern your own pupils. Do not show weakness by asking the principal or school board to come to your assistance, unless in a great emergency. The teacher who is continually referring cases of discipline to the principal or board cannot long maintain control of her school.—*Greenwood's Principles of Education.*

Manitoba's New School Law.

The department is to consist practically of the Government, but the technical work is vested in the Advisory Board of five. Two nominated by the Government, one elected by the Provincial School Trustees, one by the Teachers, and one by the University Council.

Religious exercises in the public schools shall be conducted according to the regulations of the Advisory Board. The time for such religious exercises shall be just before the closing hour in the afternoon. In case the parent or guardian notifies the teacher that he does not wish such pupil to attend such religious exercises, then such pupil shall be dismissed before such religious exercises take place. Religious exercises shall be held in a public school entirely at the option of the school trustees for the district, and upon receiving written authority from the trustees it shall be the duty of the teachers to hold such religious exercises. The public schools shall be entirely non-sectarian, and no religious instruction or exercises shall be allowed therein except as above provided. The Act came into effect on May first.—*Manitoba Colonist.*

The *Writer* gives these four lines concerning the proper use of *shall* and *will*:

> " In the first person, simply, *shall* foretells;
> In *will* a threat or else a promise dwells;
> *Shall* in the second or the third doth threat,
> *Will* simply then foretells the future feat."

Paraphrasing is a kind of exercise that has several uses.

1. To bind the student's attention closely to every word and phrase, meaning and shadow of meaning.
2. To enable the teacher to tell whether the student has accurately and fully understood the passage.

Paraphrase the following:

> "How happy is he born and taught
> That serveth not another's will—
> Whose armour is his honest thought,
> And simple truth his utmost skill."

This may be changed to prose as follows:

" How happy by birth, as well as by education, is the man who is not obliged to be a slave to the will of another—whose only armour is his honesty and simple goodness, whose best and utmost skill lies in plain straight-forwardness."

Never find fault unless compelled to do so. The witholding of praise will soon be regarded as an expression of displeasure. So you will save time and temper.

EDUCATIONAL OPINION.

The value of an education is not to be estimated in dollars and cents. Knowledge cannot be weighed in a commercial scale. The primary question is not whether a man can make ten dollars per week, uneducated, or twenty dollars per week, educated; it is, how can he make the most of himself, how can he best develop his personality, how can he accomplish the greatest good for the greatest number?

A bright young fellow recently asked, "What good will it ever do me to study algebra?" He was measuring the value of knowledge by this little tape-measure, whose divisions are the symbol $. It was explained to him that the "good" consisted in the mental advancement accruing from disciplining the mind to systematic reasoning; that while he might never use what he learned in the exact form in which he learned it, and while he might apparently forget it, yet the effect of his study would remain through life in the ability to think better and to grapple more successfully with difficult questions. An esteemed friend recently put this thought neatly when he said that while he could not now recollect what particular food he ate for dinner a month ago, yet that food went towards building up the wasted physical tissues, and so while he could not now remember the formulas and principles of the higher mathematics which he studied in college years ago, yet those formulas and principles helped to build up his mind and to make him intellectually the man he has become.—*U. S. Education Report.*

Our Normal School is doing excellent and efficient work, but no one will deny that its efficiency would be increased by lopping off the work that properly belongs to the high schools and making it in reality what it is in name. The local government contributes liberally to the maintenance of our schools and academies, and wholly supports the Normal School, thus practically paying twice, to a certain extent, for the same work. From a business point of view this would be considered extravagant. Let each institution do its own peculiar work, and we will have better teachers and better schools.—*Truro Guardian.*

The New Brunswick base ball league, which consists of clubs made up mainly of imported players, will have little effect in the promotion of healthful sport in the province, nor will the winning club bring much glory to the city which supports it. It is all just a matter of money. What we want is less of the professional and more of the amateur in the games for the young and rising generation.—*St. Croix Courier.*

PERSONAL.

The University of New Brunswick has conferred the Degree of B.Sc., on Mr. Philip Cox, Principal of the Newcastle High School. This is a deserved recognition of Mr. Cox's abilities as a working naturalist. He is a recognized authority on the birds of the province, and is a close student in other branches of natural science.

Prof. Maxime Ingres, of the Ingres-Coutellier School of Modern Languages, is writing a series of articles on Public Instruction in France in the St. John *Daily Sun.* Prof. Ingres shows an intimate knowledge of the history of education in France, and the ease with which he uses the English language gives evidence of a ripe scholarship.

Mr. Edward Fulton, B. A., (Dalhousie) at present supplying Dr. Hall's place in the Truro Normal School, has been admitted to the senior class of Harvard. Graduation with honors from Dalhousie, we are informed, will admit to the post-graduate course at Harvard.

Principal Campbell sends us a large bouquet of *Viola pubescens* from the Salmon River, Truro. He also says the species is quite abundant on the St. Mary's River, Guysboro, N. S.

Herr Lothar Bober, of the Conversation School of Modern Languages, has large classes in German, in Picton and New Glasgow.

The Halifax Teachers' Association, are now specially studying Botany under the direction of Principal Ida M. Creighton of Compton Avenue School.

Dr. Burwash, professor of natural science at Mount Allison, has accepted a chair in Victoria College, Coburg, Ont.

Mr. John Nicholson, a graduate of McGill College, has been appointed Superintendent of Education for Prince Edward Island.

AMONG THE HIGH SCHOOLS.

One hundred and one students stood the terminal examination in the Truro Academy, instead of seventy as formerly reported. A musical and literary entertainment given by the students, under the leadership of Miss Griffin, added more than one hundred dollars to the funds.

Halifax Academy opens with two hundred and fifteen students. The attendance last term was ten per cent larger than ever before. Military drill as in the new physical exercise book has been introduced.

Pictou Academy opens with over one hundred and seventy.

QUESTION DEPARTMENT.

There is a stack of hay in the shape of a cone. 15ft. high. A. owns two-thirds, B. one-third. How much must A. take from the top in order to get his share?

The solidity of a cone = $\frac{1}{3}$(area of base × perp. ht.

Let C = circumference of base of cone.

c = " " A's share.

H = height of cone.

h = " A's share.

Then sol. of cone $= \frac{1}{3}(C^2 \times 07958 \times 15)$

$= 5C^2 \times 07958$

And sol. of A's share $= \frac{1}{3}(c^2 \times \cdot 07958 \times h)$

$= \frac{hc^2}{3} \times \cdot 07958$

Since A's share $= \frac{2}{3}$ of whole cone

$\therefore \frac{hc^2}{3} \times 07958 = \frac{2}{3}(5C^2 \times \cdot 07958)$

Divide by ·07958 $\frac{hc^2}{3} = \frac{2}{3}(5C^2)$

Multiply by 3 $hc^2 = 10C^2$

$h = \frac{10C^2}{c^2}$

Again, in a cone, sections made by planes parallel to the base are curves similar to the base; and the ratio between the two curves is equal to the ratio of their distances from the apex of the cone.

That is $C : c :: H : h$

In this case $C : c :: 15 : h$

$\therefore \frac{C}{c} = \frac{15}{h}$

Substitute this value of $\frac{C}{c}$ in $h = \frac{10C^2}{c^2}$

That is $h = 10(\frac{15}{h})^2$

$h = 10(\frac{225}{h^2})$

$h^3 = 2250$

$h = \sqrt[3]{2250}$

$\therefore h = 13 \cdot 1$ Ans.

BOOK REVIEWS.

Practical Lessons in German Conversation. A companion to all German Grammars, by A. L. Meissner, M. A., Ph. D., D. Lit., Librarian and Professor of Modern Languages in Queen's College, Belfast Pp. xi 243. (Boston, D C Heath & Co., Publishers, 1889.) This volume is one which may be a companion to any German Grammar as its title page implies; and will be found a valuable companion for any German student. The German conversation is on one page faced by the English on the other. The conversation appears to be admirably selected with a view apparently to cover all the most likely topics of conversation While our cousins across the border are very energetic in publishing books in superior form, we notice that many of them are of British authorship, as is this one The idea appears to be to get a good book, altogether independent of the nationality of the author—a principle of which every intelligent man must approve

Sessenheim, from Gœthe's "Dichtung und Wahrheit, edited with an introduction and notes by H. C. O. Huss, Ph.D pp. 83, paper Boston, D. C. Heath & Co., 1889. One of the most interesting romances of the immortal German author, based on his own experience at Sessenheim near Strasburg, in the university in which he finished his studies in law, 1771.

A Primer of School Management. Pedagogical Primer Series, No 1, pp. 45, paper. (C. W. Bardeen, Syracuse, N. Y., 1890.) A small, cheap, concisely expressed summary of an extensive subject. The Pedagogical Primer Series has opened out well in its No. 1

Exercises in French Syntax, by F. Storr, Head-master Modern Subjects Merchants Taylors' Schools, London. Boston, D C. Heath & Co., Publishers. This is a small book of about 100 pages containing explanations of difficulties of French syntax. The grouping is excellent, and it cannot fail to be a great acquisition to a French student.

Classics for Children. Heroic ballads, with poems of war and patriotism, edited with notes by D. H. Montgomery, pp vii+316. (Boston, U. S. A., Ginn & Company, 1890.) Selections from standard English, Scottish, Irish, American, and other patriotic and martial poems.

The Best Elizabethan Plays. Edited with an introduction by William R. Thayer. Boston, Ginn & Co, Publishers. The selection comprises *The Jew of Malta*, by Marlowe; *The Alchemist*, by Ben Jonson; *Philaster*, by Beaumont and Fletcher; *The Two Noble Kinsmen*, by Fletcher and Shakespeare; and *The Duchess of Malfy*, by Webster. It thus furnishes not only the best specimen of the dramatic works of each of the five Elizabethan Poets who rank next to Shakespeare, but also a general view of the development of the English Drama from its rise in Marlowe to its last strong expression in Webster. This volume appeals to the general reader who wishes to get, in a small compass, the best products of the Elizabethan Drama (exclusive of Shakespeare), and also to the students in academies or colleges, who are studying this most important period of English Literature. It is a work equally well adapted to the library and to the class-room.

The Alcestis of Euripides, and Virgil's Æneid, Book III, with introduction, notes and a complete vocabulary. These are the latest publications in the Elementary Classics Series by MacMillan & Co., London, and New York. Sudents will regard with pleasure any additions to this cheap and excellent series. The little volumes just published are as admirable in typographical excellence and literary finish as their predecessors

American Farms, by J. R Elliott, Annapolis Co., N.S. This very readable book is the latest in Putnam's well known series of *Questions for the Day*, and no public question is of wider scope. For it relates to the whole agricultural interest throughout the world, though dealing especially with Canada and the United States. The author is in downright earnest, and has marshalled an array of facts and figures to prove that the farmer is everywhere being pressed to the wall by the other classes of the community in consequence of his not acting in political concert with his own class as the others do, and as they can more conveniently do, from the fact that they are collected in cities and towns, and thus able to act more *en masse*. Farmers should study this book, and learn the dangers that threaten them, and how if possible to comfront or avoid them. The present is an age of wholesale migration from the country into town, as well as of the development of giant industries; and if, as the author contends, the farmer is placed at a heavy political disadvantage, it is the interest of the community at large, that the wrong should be righted. Mr Elliott puts in a strong plea for the rights of agriculture, and his statements should be weighed, and if erroneous combated The question in fact, is one that concerns all thoughtful minds. The numerous references and questions show that the writer has sought to elucidate his subject from all sources, and invest it with the interest it deserves, and, the result is, as before said, to produce a very readable, and instructive work.

BOOKS RECEIVED.

First Greek Grammar Syntax, by W. Gunion Rutherford. MacMillan & Co., London, and New York.

Robert Browning. C. W. Bardeen, Syracuse, N. Y.

How to Preserve Health. American News Co., N. Y.

PUBLICATIONS RECEIVED.

In *Century* for June is begun a cleverly written story—The Anglomaniacs....Among the subjects treated in the Popular Science Monthly for June are—Education and Crime, Tin and its Native land, Animal and Plant Lore... St. Nicholas for June is an exceedingly good number, both in illustrations and reading matter.... *Wide Awake* for June is a bright and readable number and will be enjoyed by young folks....The Toronto *Educational Journal* commences its fourth volume with a new and appropriate heading and is otherwise much improved in appearance....The *Maritime Medical News*, although a native production, seems to take rank with medical journals of a greater constituency....The April number of the *American Naturalist* has an interesting article on the history of Garden Vegetables....The April *Microscope* has an illustrated article on "A Busy Man's Microscopical Laboratory....We have not seen the *American Geologist* since March. ..*Science* in its weekly rounds is filled with a great variety of interesting scientific news....*L'Enseignement Primaire* of Quebec is specially interesting to us, partly, we suppose, on account of the difference in our systems of education.

Making Money in Vacation.

About one year ago I procured instructions for plating with Gold, Silver and Nickel, and devoted my summer vacation to plating. In 43 days I cleared $391 10, a sufficient amount to pay my expenses for the college year. At nearly every house I plated spoons, castors or jewelry, and find it pleasant, instructive and profitable My brother in 19 days cleared $162.40. Knowing that there are many desiring an education who have not the necessary means I trust that my experience will be to such, a joyful revelation. By sending 25 cents to The Zanesville Chemical Co., Zanesville, Ohio, you will receive directions for making Gold, Silver and Nickel solutions, with the necessary instructions for using them, and in an hour's practice you will be quite proficient.

NELLIE B———.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

Zoology, 8 lectures—By Principal A H. MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.

Botany, 8 lectures—By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.

Mineralogy, 8 lectures—By A. J. Pineo, A. M., Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.

Physics, 8 lectures—By Principal E McKay, New Glasgow.

Chemistry, 8 lectures—By Prof. A E. Coldwell, Acadia College, Wolfville; assisted by W. T. Kennedy, Esq., Halifax Academy.

Physiology, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville.

Geology, 4 lectures—By Prof. Kennedy, Kings College, Windsor.

Astronomy, 4 lectures—By Principal Cameron, Yarmouth Academy.

Tonic Sol-fa—Miss A. F. Ryan, St. Mary's School, Halifax.

Elocution—By Miss H. E. Wallace, Acadia Seminary, Wolfville.

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Secretary Summer School of Science,
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Halifax, 7th February, 1890.

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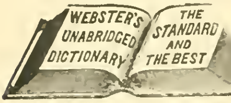

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There are several of these reprints, differing in minor particulars, but **don't be duped,** the body of each is a literal copy of the 1847 edition.

WHAT THE PAPERS SAY.

The **New York Times** says:

"Only those who are ignorant of the great advances that have been made in dictionaries are likely to buy this reprint at any price."

The **American Bookseller** of N. Y., says:

"The etymologies are utterly misleading, and naturally so; for when the Webster of 1847 was issued Comparative Philology was in its cradle. The definitions are imperfect, requiring condensation, re-arrangement and additions. The vocabulary is defective, some of the commonest words of to-day especially scientific terms for which a dictionary is most often consulted, being entirely absent. In not one of these three prime requisites of a dictionary is the Webster reprint a trustworthy guide, or, rather, it is a misleading one. * * * This 'reprint' is not intended for intelligent men. It is made expressely to be foisted by all the arts of the book canvasser on those who have been precluded from a knowledge of what developments lexicography has undergone during the last forty-two yeas. This is the cruelest feature of this money making enterprise."

The **Buffalo Christian Advocate** says:

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The Educational Review.

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Editor for P. E. Island.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

THE next number of the REVIEW—a double one—will be published about the 10th of September.

IN response to pressing requests representing some hundreds of our subscribers, we take up larger than the average space for reference to insects which are at present more or less malevolently disporting themselves among us.

The 33rd annual session of the institution for the deaf and dumb, Halifax, was closed with public exercises on the 28th ultimo. 331 deaf mutes were admitted during the 33 years. The attendance this year was 59. Written examinations were held, on the results of which prizes and class standing were awarded. Both the sign system and oral teaching are employed. Principal Hutton is assisted by four teachers, Mr. Lawrence, Mr. MacDonald, Miss Mosher and Miss Bateman. The pupils are very expert with the pen, which has to take place of the tongue with them to a very great extent. They are, to a remarkable degree, taught to speak, but as they cannot hear their own speech, it must be with them an exercise of faith. A forcible contraction of certain muscles of the mouth and throat appears to them to carry in some mysterious, telephonic way, their thoughts to a distant person. The slightest variation in any one of the elements of this, to them, noiseless sound, destroys the magical effect of their throat gymnastics, and the thought is not conveyed. We can understand the reason. Their idea will probably be very different. Let these children of a silent world have an idea of mathematics, history and geography, as well as your language. They have also shown fine specimens of drawing and design, painting in monochrome, modelling in clay, needle-work, etc. In no institution of the kind in the world do we believe better work to be done. Our government has made it a part of the free school system. If any deaf and dumb who have not been educated are known to our readers, a blessing may be invoked on the effort they make in giving the address of such a one to Principal Hutton or the Nova Scotia editor of the REVIEW.

THE conference of the heads of colleges, which was inaugurated at St. John during the Interprovincial convention, was held this year at Halifax, in the library of Dalhousie College. An agreeable feature of this year's meeting was the courtesy extended to its members by the Hon. John F. Stairs. Next year the superintendents of education of the different provinces are to be invited to the conference to discuss fully a uniformity of matriculation standards for the different Atlantic Province colleges.

OUR readers will be pleased to learn that Principal Cameron of Yarmouth, our astronomical editor, was elected a member of the "Astronomical Society of the Pacific" at the meeting of its directors held at the Lick Observatory on May 31st last. At the same meeting other members widely known to the astronomical world were elected, such as Dr. Gill, Astronomer Royal at the Cape of Good Hope; Prof. Prichett of Washington University, St. Louis; and Dr. Kohl of Denmark. The Astronomical Society of the Pacific was founded in February, 1889, stimulated into existence by the great Lick Observatory, perhaps the most remarkable in the world. Those who have assisted in supporting the REVIEW must have no small satisfaction in seeing that in our department of science at least it is winning not only a high character for itself, but no mean credit for our country.

THE N. B. EDUCATIONAL INSTITUTE.

The N. B. Educational Institute met this year at Moncton—the first year in its history in which a meeting was held outside of St. John or Fredericton. The Moncton Board of Trustees, teachers, and people generally, vied with each other in extending to the visitors a cordial welcome. And Moncton has something to show in educational progress which has quite kept pace with her advance along other lines. If she is not already the second city in size and population in New Brunswick, she soon will be. She is ambitious, too, and fondly hopes to eclipse St. John somewhere during the twentieth century, if not sooner. Whether this hope will be realized, or not, history will tell. It is sufficient to note that the strides she is making in education will soon place her, in that respect, in the front rank of New Brunswick cities. She will soon have ready for occupation, the finest school building in the province, outside of the Victoria and Centennial in St. John. The Board of School Trustees is composed of some of the most public-spirited of her citizens, and Mr. C. R. Palmer, who fills the office of Secretary and Superintendent of schools, brings to his work an intelligence and progressive spirit that has already brought Moncton rapidly to the front in her educational development.

In spite of the dull weather, the Opera House was crowded to the doors on the occasion of the public educational meeting held on the evening of the first day on which the Institute was in session. A fine musical programme was carried out with excellent taste and spirit. Supt. Crocket, who presided, made an able and thoughtful address on education, in reply to Mayor Sumner's address of welcome to the teachers. President Harrison, of the N. B. University, in a strong and earnest plea on behalf of that institution, successfully replied to the attacks made recently upon it. President Inch, of Mt. Allison, impressed strongly upon teachers the nobility of their calling, and the high claims it had upon the people. Other addresses were given by Dr. Bailey, Mrs. MacFarland, Mr. Robinson, chairman of the Moncton Board of School Trustees, and Hon. D. L. Hanington.

Nearly all the work of the Institute that was laid down in the programme was accomplished in one day. Some excellent papers were read, and the discussions following them were suggestive and pointed. We are sorry that brief space compels us to give only the mere outline of the proceedings that is found in another column. To carry out such a programme in so short a time required tact and judgment on the part of the presiding officer, and brevity and good sense in those who read papers and debated questions. Both requisites were not lacking, and the result was one of the most successful institutes ever held in the province. There was much in the addresses that teachers could carry away with them and think over. Without enumerating those fully, it may be said the paper of Inspector Bridges, followed by the address of Principal Cox, on the cultivation of patriotism in schools, although delivered at a late hour in the proceedings of the institute, were heard with a fixed attention, and received at the close such a round of applause that there was no doubt but a responsive chord was touched in the popular heart. These two companion addresses should be published in full. They are of interest to Canadians everywhere.

MEDICAL MATRICULATION.

We have on a previous occasion referred to the raising of the standard of the Preliminary Law Examination and its adjustment to the public school course prescribed by law. We are sorry not to be able to say so much for the Medical Matriculation Examination. There is no reason in the world why a medical student in Nova Scotia should not complete the High School Course before he enters on his medical studies. As it is, a boy who has not the scholarly qualifications of a second class teacher, can enter the profession. In the olden time, when there were no facilities for obtaining an education, and when the profession was not crowded, there might be an excuse for it. There is none now; even should Yankee or European Medical Colleges still continue the practice. If they come to our provinces, let them first show their ability to pass our Matriculation Standard before registration. A boy who cannot master the mysteries of our High School Course at a reasonable age is not old enough to enter upon a profession of such transcendent mystery and responsibility as that of medicine.

HELIGOLAND, Etc.

Heligoland, it appears, is no longer to be part of the British Empire. In 1807, Helig Land (Holy Land) was captured from Denmark. The rock itself which is fast wearing away, together with Sandy Island formed an area of about three quarters of a square mile, with a population of 2,000 Frisians. About 15,000 Germans and others visit it annually during the bathing season. It is only twenty-five miles from the mouth of the Elbe. In return the Empire is enlarged by the virtual admission of Zanzibar, distant twenty-five miles from the West coast of Africa, with an area of 614 square miles of extraordinary fertility having a population of 200,000, a capital with a population 80,000. The annual trade of the Island is represented by $4,000,000 of imports, and $6,000,000 of exports. But in addition nearly the whole African coast north of Zanzibar to the Gulf of Aden has come virtually into the Empire, which on the whole is increased by about twice the area of the German Empire itself. Mutual concessions between the British and Germans have been made in Central Africa. The Portuguese territory is co-terminous with much of the German boundary. It remains to be seen if after some further experience the Portuguese will find the Germans more considerate neighbors than the long suffering Britons whom they are now so angry with. Our maps must be altered.

The Halifax Academy closed on June 27th, with a musical and literary programme in five languages: English, Latin, Greek, French and German. The large convocation hall was packed with about eight hundred people. The Hon. J. W. Longley, attorney general, Robert Taylor, Esq., chairman of school commissioners, Judge Motton, Rev. D. M. Gordon and Rev. President Forrest, who were present on the platform, highly eulogised the institution. The chairman of the school board was also congratulated on the rapid improvement in all grades of the public schools in the city under the present supervisor.

The musical and other excellencies of the entertainment were specially due to the genius and energy of Miss Mackintosh, of the academic staff.

Mr. W. F. Ganong, instructor in botany at Harvard, will conduct Dr. Goodale's class next year while the latter is absent in Europe.

The indications are that the attendance at the summer school, to meet at Parrsboro on the 21st inst., will be greater than ever before.

Plant Study in July.

Among the plants that should be looked for in July are the two Sundews—*Drosera rotundifolia* and *D. intermedia*, var. *Americana*. Both are found in damp soil, by the way side, or in sphagnous swamps. Both have rosettes of leaves, beset with small reddish spines, which are tipped with a little drop of a clear, glutinous fluid which glistens in the sunlight like dew—hence the common name. This rosette of leaves as it lies open on the ground, with its glistening points, is a trap for unwary small insects. They alight upon the leaves and if they are weak and small—like mosquitoes and black flies, for instance—they fail to release themselves in spite of all their efforts. The bristles begin to enfold them, and the leaf after a few hours bends over, entombing the unfortunate insect. It is interesting to watch this process. Take up a plant with plenty of earth attached, place it in a saucer in the window, and tempt its appetite by a mosquito, or if you are too humane to make a living sacrifice, take a small piece of raw beef. Watch results. The process by which these insectivorous plants—for so they are called on account of their habits—retain and digest their food is an interesting one to watch, lasting several days.

The most common—the round-leaved sundew—is found everywhere in New Brunswick and Nova Scotia, the other form with longer spatulate leaves is less common but should be looked for. Both send up in July and August from the centre of the leaves a scape bearing a one-sided raceme of flowers.

The sphagnous swamps in July and August will furnish some of the rarest and most beautiful orchids to be found in our country. These swamps "crave wary walking," too, but with a strong pair of boots, and by avoiding the softer and more yielding places, one can get along very safely and comfortably. The Pitcher-plant (*Sarracenia purpurea*), with its purple, nodding flowers, on long scapes, with its circle of hollow, pitcher-like leaves spreading from the root, is a conspicuous object in July, in bogs and on the wet borders of lakes. This is another catcher of unwary insects. Look at the inner face of the rounded, arching hood at the top of the leaf, and there will be seen a beautifully variegated surface, with *stiff* bristles pointing downward. Then look down into the curious pitchers, half filled with water and drowned insects. Very little observation will show the road to this pit, from which, apparently, no insect traveller returns. The inner surface of the hood apparently exudes a sweetish substance, sipping which the insect unconsciously and pleasantly travels on, and when he suddenly sees the pit before him, the stiff hairs, pointing downward, prevent return. (These peat bogs and sphagnous swamps give us material for moral lessons, too, do they not?) Now, for what purpose is this wholesale slaughter of insects? Is it to provide the plant with nourishment? That is possible, but not probable. The store of food in these pitchers, perhaps tempt larger insects to drop their eggs in them, so that when hatched there may be abundance of food for the brood. The writer has seen pupa cases in the putrid remains of old leaves. The subject needs further investigation. Let us examine more fully this summer. Do not fail to examine carefully the wonderful structure of the flower. as well as the leaves of the pitcher-plant

Some beautiful orchids will be found in sphagnous swamps, in July. You will be sure to notice two, which are common, and very beautiful: *Arethusa bulbosa* has a single, rose-purple flower, on the top of a sheathed scape, which rises from a solid bulb buried in the sphagnous moss. *Calopogon pulchellus* also rises from a solid bulb buried in the moss, has a grass-like leaf, and bears two or more pink purple flowers. The white-fringed orchis may also be found in swamps, with other handsome orchids. Remember that July and August are the months for orchids—our most beautiful and showy plants. Many are rare as well as beautiful. The showy Lady's Slipper—*Cypripedium spectabile*—will give you such pleasure that the remembrance will last for a life time. Look for it in cedar swamps.

Good teachers must be left free to work out the required ends in their own way. Freedom and responsibility in the teacher are a cardinal element of the new educarion.—*Supt. Geo. A. Littlefield.*

FERNDALE NOTES.

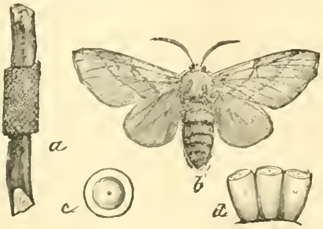
Caterpillars on the Rampage.

Cold news for me;
Thus are my blossoms blasted in the bud,
And caterpillars eat my leaves away.
—*Henry VI., Part II., Act* 3, *Sc.* 1.

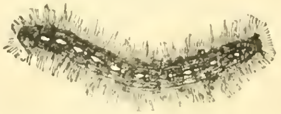
LEPIDOPTERA.

1. Forest Tent Caterpillar.

One or other of the below mentioned *clisiocampa* caterpillars have been troublesome in orchards about this season of the year, have defoliated many square miles of forest occasionally, and in their migration across railway tracks have often stopped trains on up grades on account of the grease-like effect of their smashed bodies on the rails. We give first the species which we have generally observed in northern Nova Scotia, *Clisiocampa sylvatica* (the Forest Tent Caterpillar).



b the Moth. *a* the Eggs, laid in a ring about a small twig of a tree in the fall. *c* end view of the Egg magnified. *d* side view of three Eggs magnified.



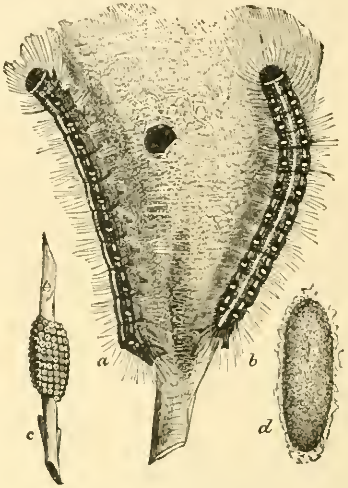
Larva or Caterpillar of the same.

Life History: Eggs between 200 and 300 in a firm ring around a small twig. In May the eggs hatch out and the larvæ feed on the young leaves. In a month and a half they are full grown, about an inch and a half in length, or more, of a pale bluish color, thickly spattered with black. Ten or eleven oval white spots form a row along its back. In the next species there is a continuous line of white instead. Pale yellow broken lines, with gray, are found on its sides. The hair is fox colored, mixed with coarser whitish hairs. It then spins a cocoon, whitish yellow in color. In about three weeks, or in July, the perfect moth comes out, ready to deposit its eggs again. There are several insect enemies of this species: a tachina fly, an ichneumon fly or two, some large beetles and a fungoid growth. The best preventative is a close search for and destruction of the small rings of eggs in winter or early spring.

2. American Tent Caterpillar.

Clisiocampa Americana (the American Tent Caterpillar), has a very similar life history.

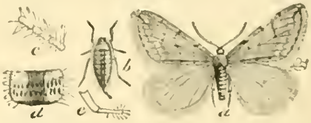
This species differs from the other in the moth stage, by being of a redder brown, the two wing bands being whitish, instead of a dark brown, the space between the bands being also paler than in the other. The ring of eggs is more spindle shaped, instead of being cylindrical. The eggs are also more conical than cylindrical as in the other species. The larva has a white, continuous line along the back, not a row of oval or diamond-shaped white spots.



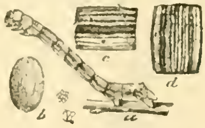
a and *b* Two Larvæ. *c* Ring of Eggs. *d* Cocoon.

3. The Spring Canker Worm.

Here we give a cut representing the different phases and parts of *Anisopteryx vernata* (the Spring Canker Worm).



Male Moth, *a*. Female, *b*, wingless, with its Egg Placer magnified at *e*. A segment of its body is magnified at *d*, and shows two rows of minute, reddish spines on it. A portion of its antennæ is shown magnified at *c*.



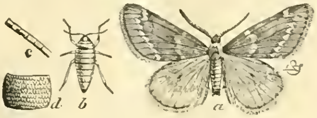
Larva at *a*. Eggs at *b*, one magnified. Side of a segment of the larva magnified at c. Back of segment magnified at *d*.

Life History: The eggs are generally laid in small masses, in crevices of the bark, by the wingless female, which has to walk up the trunk of the tree from the ground, where it passed its pupa state. The young caterpillar is of a dark olive green, or brown, with a black shining head, and a black plate on the next segment. They are variable in the color of the bands and mottlings when older. It is hatched in time for the young leaf in May. By the end of June they are an inch long, and if numerous, have destroyed much foliage. The caterpillars, having no feet under the middle of their bodies, move by a looping motion, and are therefore called "loopers," "yard sticks," "measuring" or "geometrid" caterpillars. They next fall from the branch to the earth by means of a silk spider-web-like thread, go from two to six inches into the soil, spin a cocoon, change to the pupa, and come out as perfect moths with the first warmth of spring. The male is winged. The wingless female can deposit no eggs on the tree if a band of paper and tar, or other obstruction, be placed around the stem near the ground to prevent its ascending.

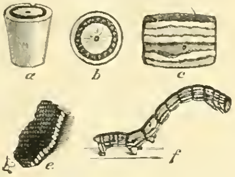
4. The Fall Canker Worm.

Anisopteryx vernata (the Fall Canker Worm), has a similar appearance and history. The principal difference being its habit of emerging from the pupa state in the fall, when the female deposits its eggs on the trees, all ready for the influence of the spring sun.

The difference between the species is most readily shown by a comparison of the following cuts with the former ones.



Male Moth, *a*. Female, *b*. Portion of antenna magnified, *c*. Segment of body magnified, *d*.



Side and end view of Egg magnified, *a* and *b*. Segment of body magnified, *c*. A sheet layer of eggs, *e*. The larva, *f*.

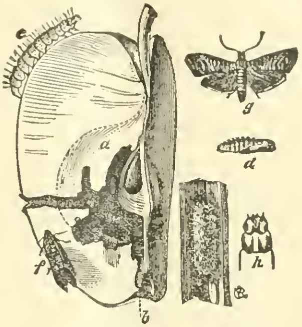
Prevention : Bands covered with sticky tar around base of trunk, tar filling crevices of bark so as to admit of the passage up of neither the female nor minute lately hatched caterpillars from below. If they are already in possession, spray the tree in May when the buds commence to open (and the eggs to hatch), with paris green (one ounce to fifteen gallons of water). Repeat the spraying as the petals fall from the blossoms in June.

5. The Codling Moth.

Carpocapsa pomonella (the Codling Moth) is another destroyer. Here is shown a specimen of its work and a sketch of its stages. It has destroyed $10,000,000 worth of fruit anually in America. Came across from Europe about 90 years ago.

Life History : Moth, with fore wings streaked with grey and brown, and a brownish spot and streaks of gilding on the inner hind portion. Hind wings and body are of a satin yellowish brown. Just as the apple-blossom opens the female deposits a tiny yellow egg right in its centre. One moth may treat fifty blossoms in this manner in a week or two. In one week the egg is hatched, and the larva begins to dig its way into the core of the apple, where it stays for about a month. It then eats its way out, swings itself to the ground by means of a fine thread of silk, or perhaps crawls down the trunk. It then selects a crevice or shelter, spins a minute cocoon; in a fortnight the moth comes out and proceeds to deposit the second crop of eggs. Many of the second brood do not leave the apples until after they are barrelled, where their cocoons may in a short time be found in crevices and under the hoops.

Prevention : Spray the tree with a well stirred paris green mixture of one ounce of the poison to fifteen gallons of water, just as the blossom is falling. The eggs are just then being hatched and the smallest particle of the poison eaten by the larva is death to it. Put bands of cloth around the tree for the larvæ to place their cocoons under. Take the bands off weekly and destroy the cocoons.



The Moth at *f* and *g*. The Larva at *e*. Its head magnified at *h*. The Cocoon at *i*. The Chrysalis at *d*; and its work at *a*.

HYMENOPTERA.

6. The Currant Worm.

Nematus ventricocus (the imported Currant Worm) is very destructive to our currants and gooseberries. It came from Europe in 1858. It is a four-winged fly about as big as a house fly (Our cuts, we regret, did not arrive in time to go to press.) The body of the fly is black, with a few dull yellow spots above, the under side of the abdomen being yellowish, and the legs bright yellow. The veins of the wings are blackish. The female is yellower and larger than the male. They are active only during the hot portion of the day. The female deposits the eggs on the under veins of the leaves in rows only 1-30 of an inch in length. They afterwards increase in size, and in a week and a half are hatched and appear about 1-12 of an inch in length. They soon become about ¾ of an inch in length, and of a green color, with black dots. They then form brown papery cocoons on or under ground, or under leaves, from which they emerge in early July as the perfect four-winged fly, ready to repeat another cycle of insect life This caterpillar must not be confounded with the currant span-worm, which is known by its "looping,' and is the larva of a geometrid moth.

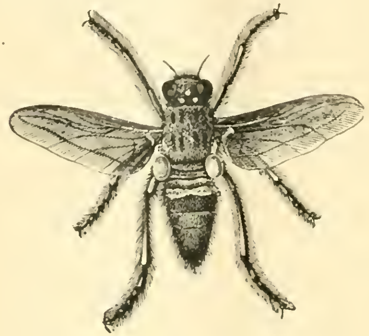
7. The Larch Saw Fly.

Nematus erichsonii (the Larch Saw Fly) is the newest immigrant into our province. It is very much like the last, as would be expected from its belonging to the very same genus *nematus*. In 1880 it was noticed first in the vicinity of Boston; in 1882 in Quebec, then in Maine and New Brunswick; in 1888 in western Nova Scotia; in 1889 it made further progress westward; and in the September Review of last year, its arrival in the larch forests of central Nova Scotia was predicted. Its presence will be first announced by defoliated larches, which will look as bare as if their leaves were scorched off by fire. In the absence of our cut, we can only refer our readers to a four-winged fly of about the size of a small house fly. The larvæ are not unlike those last discussed, and the cocoon can be had by enclosing some of the mature worms, with some larch foliage, in a box.

DIPTERA.

8. The Ox-Gad Fly.

Here we have a magnified figure of the two-winged fly, *Œstrus bovis* (the Ox-Gad Fly).



It is found tormenting the cattle, from June to September, in endeavoring to place its eggs on the back of the cattle. When the egg is placed, it is soon hatched, the maggot burrows under the skin, grows large during the winter, forming lumps under the hide. By June or July it enlarges the hole in the hide, tumbles out to the ground, becomes a pupa in a hard, black covering, and in a month becomes a fly, teasing the cattle as did its parent.

9. The Horse Breeze Fly.

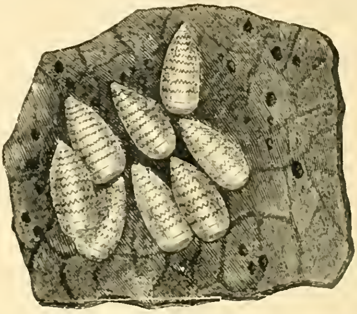
Œstrus equis (the Horse Breeze Fly) is a close relative of the last. Here are figured the male and female.

Male.

Female.

The female attempts to place its eggs on the hair of the horse. On touching the hair the natural cement hardens rapidly. It is placed by the insect's instinct where the horse is most likely to scrape with his teeth. The egg once in the horse's mouth, is swallowed, and when hatched the larva clings to the stomach as shown on the portion of the same figured here. When mature they lose hold, pass through the body, fall to the ground, change to the pupa, and in June or July change to the perfect fly.

Eggs of the Horse Breeze Fly, hair magnified.



10. The Sheep Bot Fly.

Œstrus ovis (the Sheep Bot Fly) is still another near relative. Here it is, magnified about three times. The female endeavors to place its eggs on the nostrils of the sheep during the warm weather. The egg is soon hatched, and the maggot creeps up the nose and hooks itself to the mucous membrane of some of the upper cavities. When many larvæ are present, the health of the animal suffers severely, and sometimes death is caused by injury done to the brain through the cribriform bone above the nasal cavity. The larva reaches maturity in June and falls to the ground; in one day it changes to the pupa, and in six or seven weeks it emerges, in July, as the perfect fly.

It appears from the decision of Judge Bain that the Legislature of Manitoba, was not acting *ultra vires* in abolishing separate schools in that Province.

In the report of the Public Schools of Newfoundland under Roman Catholic Boards for the last year, the amendments to the Education Act passed at the last session of the Legislature are summed up as follows:

(1). Increasing the amounts of the votes, under sections four and seven, from $2,000.00 and $2,607.00, respectively, to $5,000.00 each, "from the year 1890, inclusive;" (2) determining the date of expiry for certificates of grade granted previous to the passing of the Education Act of 1887, to be five years from May of that year; (3) imposing upon teachers certain duties in relation to the observance of an Arbor Day; (4) making some important alterations in the arrangements connected with the "Newfoundland Jubilee Scholarship" examinations. These matters will be referred to somewhat more in detail under their appropriate headings.

The Halifax Ladies' College closed on the 24th. Over 200 were in attendance during the year, of which 50 per cent were boarders,

Astronomical Notes.

Conjunction of Venus and Saturn.

Look out for the conjunction of Venus and Saturn on July 17th. Also for the cholera, earthquakes, and other things that are to follow.

Perhaps these things won't follow. Let us hope they won't. Perhaps the sky won't be clear. Let us hope it will.

About the conjunction itself there is no perhaps. That's where astronomy has the advantage over meteorology and astrology.

A "conjunction" is defined by Newcomb as "the nearest apparent approach of two heavenly bodies which seem to pass each other in their course. They are commonly considered as in conjunction when they have the same longitude." Those who need a completer or preciser definition are usually able to make one for themselves.

A conjunction of Venus and Saturn is not a very rare phenomenon. It is only ten months since we had the last one, and we shall have the next one in fourteen months more. But they are not all equally interesting to the star-gazer. In order to see the one last year you had to stay up all night, or turn out before sunrise. The one next year won't be visible at all. This year we can look at it in the afternoon or evening. And this year it will be better worth looking at than usual. Last year the nearest approach of the two planets was over half a degree. Next year it will be about the same. But this year they will approach nearer than a tenth of a degree—this nearest approach however will happen at our mid-day.

The conjunction will take place near Regulus, the the star at the end of the handle of the Sickle. So did the conjunction of September last. During the ten months between then and now, Venus has been all round the zodiac, while Saturn has advanced only three degrees beyond where he was then. This three degrees is not all the travelling Saturn has done in the meantime. For four months and a half he was engaged in that retrograding business that we have been watching Mars at lately, and which is such a puzzling thing to the young star-gazer. It takes him three months more to make up the ground which he lost while backing, and thus he has only four and a half months left out of the twelve in which to make headway on his journey among the stars. And as he is a very slow old chap at the best, he does very little in that time. We have had him near Regulus for several months past. Now he is moving off to the east, and he won't get back to Regulus again until about 1920.

Venus has had no backing to do since she passed Regulus in September last. If she had she would not have got round so soon again. But her turn is coming in the fall. Then she will have to double and twist and turn and zigzag like the rest of them, and, instead of coming round to Regulus in less than ten months as she has done this time, it will take her more than thirteen months to do so.

No one needs to be told where to look for Venus in the evening. But it is not always necessary to wait until evening in order to see her. For more than three months back she has been bright enough to be seen at mid-day with the naked eye. During this time she has been growing brighter, and will so continue until the end of October. And so, on any clear day between now and the middle of November, there will be but little difficulty in picking her up in daylight. The little difficulty will be in finding out where to look for her. This is easiest done when she is on the meridian, that is when she is due south. Your almanac should tell you at what time of the afternoon this happens, and also, what the declination of Venus is. From the declination and your latitude you can find how high she will be when on the meridian. Then, if you know where your meridian is, go out at the given time, and look up at the proper altitude, or as near there as you can guess. Having once found her, note her position from your standpoint with respect to a chimney, or a steeple, or something. Then, next day about the same time you will find her about the same place, and so on from day to day, as long as she is visible. Seeing Venus with the naked eye in the day-time is not at all so rare a thing, and by no means so difficult a thing, as is generally supposed.

But you must not expect to be able to see Saturn in day-light with the naked eye. There may be eyes that can perform this feat, but they must be unusually sharp ones—that is, to see Saturn as he is at present. The afternoon of the day of conjunction (July 17), or of a day or two before or after, will be a good time to try him as a test, either of your eyes or your glass. He will then be near Venus (for how near, and in which direction see next paragraph) and having found her you will know just where to look for him. If you can't manage to see him in the afternoon, you might find some amusement in trying how early in the evening you can pick him out.

About the time of their conjunction Venus is gaining on Saturn a little more than a degree a day. On the evening of July 12th, the distance between them is 5°, Saturn being that far to the left of Venus. Next evening the distance is about 4°, and the evening after it is less than 3°. At 8 p. m., (60° time) on the 15th, they will be $1\frac{3}{4}$° apart. At the same hour on the 16th, there will only be 42′ between them, Saturn being still on the east side of Venus. Their nearest approach will occur at noon (60° time) on the 17th. Saturn will then be 5½′—less then a tenth of a degree—north of Venus. Both planets at this time will be two and one half hours east of the meridian in longitude 60°, and three hours east of it in longitude 68°.

But that is hardly definite enough to enable any one to find them. Well, try the following plan. The first thing is to find out whether your glass will show Saturn in daylight. On the 16th, Venus will be on the meridian, and about 60° high, at 2.36 mean time, which will be 3 (60° time) to places in longitude 66°. Even if you have only a rough idea of the location of your meridian, and only a rough idea of an altitude of 60°, your eye ought to be able to find Venus with a very little seeking. Find her, and then try with your glass for Saturn. At that time he will be nearly a degree to the left of Venus—a degree is twice the breadth of the full moon. If your glass shows Saturn, then wait until evening. Go out between 9 and 9.30, and find Gamma Aquilæ. It is the small star above Altair. About nine you will find Altair quite high up in the south-east. It is a first magnitude star, and is easily known by its having a small star on each side of it, the one above nearer and brighter than the one below. The one above is Gamma Aquilæ. Note the position of this star very carefully at 9.30 (60° time), or still better, the position at that time of a point about as far above Gamma as it is above Altair. Very nearly in that same spot on your sky, you will find Venus at noon (60° time), on the 17th, when she and Saturn are closest together. But the glass that showed Saturn on the afternoon of the 16th, may perhaps fail to show him when so close to Venus. However there is no harm in trying.

By the evening of the 17th, the planets will be a third of a degree apart, and now Saturn will be to the right of Venus. Next evening the distance between them will 1½°, and will be increased by rather more than a degree each evening after. By the evening of August 1st, Venus will have left Saturn 16° behind.

When watching a close conjunction such as this is, one naturally gets a-wondering if the planets will hit and what would happen if they did so. What would happen would probably be something very unpleasant for the inhabitants of the planets—if they have inhabitants. But there is little chance of a collision in the present case. It is true that at the moment of nearest approach there is little more than five minutes of arc between Venus and Saturn in the sky —as we see them. And it is true that this distance is no more than the length of one inch as seen from a distance of about eighteen yards. But they seem so close only because we happen to see them nearly in the same line. If we could change our point of view—if for instance we could at the time of conjunction jump from here to the sun and look at Saturn and Venus from there, we would see them separated by 54". Or suppose we could get across the hundred million miles that separate us at present from Venus, and, standing on the side of Venus nearest to Saturn, should try to toss a biscuit over on to Saturn as we pass him. As the two will look from here on the 17th, this will seem quite an easy feat—the tossing of a biscuit from one to the other I mean, not the getting from here to Venus. But to get from one to the other, that biscuit would have to be tossed eight times as far as from here to Venus, for at the time of conjunction Venus will be 100 million miles from here, and Saturn will be 800 million miles beyond Venus. So there is not much chance of a collision between them, however close the shave may seem to us.

A. CAMERON.

Yarmouth, N. S.

P. S.—Belcher's and McMillan's Almanacs are at it again. Speaking of July, they say "by the end of the month Jupiter is hidden in the sun's rays." That brightest star in the sout-east in the evening is Jupiter. Watch him at the end of the month.

A. C.

For the REVIEW.]

Educational Notes.

The teachers of Amherst have begun work in botany, and hope to have the required number of specimens ere the Summer School begins.

A late Friday afternoon, Grade VIII. had a good programme, consisting of readings, recitations, and singing, accompanied by the cornet, violin, piccolo, and whistling. This was no show for outsiders, but in connection with the regular work.

Grade VII. did not wish the other grade to win all the laurels, so they have hired a piano, and the following afternoon they rendered a good programme.

The Friday afternoon promises to supply a missing link in the education of the children. In this way, they are being trained to find pleasure in literary and musical entertainment; and not only that, but they are led to produce it themselves. Can not the teacher by judicious management thus train our children, so that the greatest pleasure of our future citizens will be musical and literary entertainment? The teachers report that it has a beneficial effect on the regular work. Will it not be training in temperance?

AMHERST,

For the Review.]

On Collecting, Preserving and Studying Marine Invertebrate Animals.

BY W. F. GANONG.

*(Continued from May number).**

It will interest all of our readers to know that the naturalist's dredge, now so well known and important an implement of scientific research, was systematically used for the first time in America, in our own waters. Dr. William Stimpson must enjoy the distinction of having introduced it. In the summer of 1852 he spent three months in dredging about the Island of Grand Manan, and as a result gave us one of the most important works that has yet appeared on the natural history of Acadia.† Its form has undergone but little modification since that time.

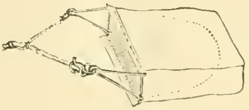


Fig. 3. The Dredge.‡

The figure presented herewith shows so well its form that we need hardly add any details except as to size and materials. The frame is of iron and can be made by any blacksmith. It is from eighteen inches to two feet in length, by six inches in breadth, the former length being the best for ordinary work. The top and bottom pieces are alike, of thin iron bars two inches broad, which are beaten to an edge along one side and bored along the other with a row of holes for the attachment of the net. The end pieces are round, three-fourths of an inch in diameter, and so welded to the top and bottom pieces that the latter diverge somewhat, making the scraping edge an inch wider apart than the edges to which the net is fastened. Double bars, a foot long, run forward for the attachment of the rope, as shown in the figure, and these are so made as to fold within the frame for convenience in transportation. The net should be of the finest meshed (hand-made preferably) that it is possible to buy, and if the meshes are so large as to allow a lead pencil to be pushed through without forcing, they should be interwoven with waterproof twine to make them smaller. The net is so sewn together as to form a bag about two feet deep; and outside of it should be placed a bag of strongest canvas, which is to prevent the net from being caught and torn on the rocks. The canvas bag should be six to twelve inches longer than the net and have no bottom in order that the water may flow freely through, and net and canvas should be securely sewn to the frame with copper wire. In the figure the dotted line represents the outlines of the net, the canvas being outside. This is the complete dredge, and when made of the best materials it should not cost more than the sum one would pay for a week's board in a modest country house by the seaside. But if one wishes to be—or rather, if one must be economical, both net and bag can be made of the coarse canvas of which potato sacks are made, and they will give good results, if used intelligently. The material of which his heart and head are made is of more importance to the dredger than the exact material of his dredge.

Abundant and rich in life as the shore is in places, still more does it abound and thrive below the reach of the lowest tide. Indeed, in favorable places, where level gravel bottoms are swept by gentle currents of purest water, the sea-bottom is probably paved with living animals almost as thickly set together as the grass and flowers of a meadow. And there is every variation found in this condition up to the comparative barrenness of muddy bottoms in impure water, and the total barrenness of rocky channels swept clean by powerful currents. It is therefore a needful preliminary to profitable dredging to obtain some knowledge of the bottoms and currents in a region, information which can be supplied in part by the Admiralty chart, and in part by the local fishermen. One can learn, after a short experience, what regions are likely to yield a good harvest and what but empty dredges. Undoubtedly the best dredging-grounds in Acadia are to be found in Passamaquoddy Bay, L'Etang Harbor, about Grand Manan, and particularly in Eastport Harbor. The latter as a collecting-ground is rivalled by but one other locality on the Atlantic coast of America, and is exceeded by none.

The dredge can if needful be worked from a rowboat, but not profitably. It is much better and will pay in the end, to hire a good sail-boat with a competent man to manage it; and the latter is very important. He can usually supply an abundance of rope for the dredge, and will usually take the greatest interest in its successful working. Having reached the proper dredging ground towards low tide on a day when there is but a light breeze, one prepares to let go the dredge by attaching one end of the rope to one of its bars, and tying the second bar to the first by a piece of stout twine. The use of this device will become clear if the dredge catches on a rocky ledge

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[* Owing to a mistake the MS. of this article did not reach the editors in time for insertion in the June number.]

† Synopsis of the Marine Invertebrata of Grand Manan. Published by the Smithsonian Institution, Washington, 1854.

‡ This figure has been in part copied from that in Emerton's "Life on the Seashore."

— the twine will break and the instrument can be drawn out sideways. Then the boat is brought up in the wind ("luff her up," the boatman will say) and the dredge is let go, the dredger being careful not to allow the bag or net to become entangled in the frame. Some dredgers place a weight on the rope several feet in front of the dredge in order to keep it near the bottom, and window-weights are excellent for this, though stones will do.

It is impossible to dredge against the tide; one must dredge with it, or across it. Enough rope must be allowed, when dredging, to make an angle of from 45° to 30° with the surface, according to the nature of the bottom. On a smooth and hard bottom the latter angle can be safely used, but on soft mud much less rope must be allowed as the dredge has a tendency to bury itself and anchor the boat. It is however, a matter which is quickly learned by experience, and a day's mistakes and successes will teach the reader more than I could in writing if the editors of the REVIEW were to give up to me this entire number for the purpose, something they are far too wise to do. One very quickly learns to judge the character of the bottom from the feeling of the dredge rope, which by the way, the dredger ought always to hold in his hand. The tight rope acts as a sort of a telephone wire and communicates to him a pleasant smooth grating when the dredge is on gravel, an irregular not jerky pulling when on mud, and abrupt jerks and leaps when amongst ledges and boulders. The other end of the dredge rope should not be fastened to the boat but to a wooden buoy so that if a squall comes up, or the dredge becomes fast on the bottom at a time when wind or tide are not favorable to releasing it by tacking back over it, the whole may be thrown over-board, and picked up at a more convenient time. Ordinarily, the time the dredge is left down depends upon the character of the bottom, and the way it is working, but in general it is profitable to draw it up every fifteen or twenty minutes. Pails and tubs full of salt water are to be ready for its contents. Experienced dredgers use a set of sieves for sifting out its contents, but these are not needed at first.

Then with what eagerness we watch for its appearance as we and our boatmen draw it slowly to the surface, and how our hearts bound when it comes over the side half-filled with the clean salt-water life. There is a perennial cleanness, brightness, and suggestion of healthiness about salt-water animals from clear water. In such places we may find bright orange and pink star-fishes, five, ten, or twelve-rayed Ophiurans of brilliant and variable colors, or Astrophytons with their thousand slender arms. There may be those exquisitely colored Ascidians which the fishermen call Sea-peaches, and the naturalists Cynthias; Sponges, Sea-anemones of brighter hues than their namesakes of the land; Spider-crabs, and Hermit-crabs in borrowed shells, Molluscs, with bivalve shells of divers form and texture, and Gasteropods with coiled and sculptured shells, and some with no shells at all; great colonies of Hydroids, with branching stems, feather-like, tree-like, and spiral, but always perfect in their symmetry; colonies of Bryozoa encrusting the rocks; writhing worms and their aristocratic relatives the Brachiopods, dozens upon dozens of forms of life of all sizes, shapes and colors, imitating almost every known object on land, or in the skies, are brought from the bottom of the sea by the naturalist's dredge. It is useless to attempt to describe it; the healthy delights of dredging must be experienced to be understood, and once experienced, one loves them for ever more.

There is yet a fourth method of collecting which should be added to these. Forbes, in his inimitable work, "History of British Starfishes," thus indicates it:—

"The stomachs of fishes are often zoological treasuries. The haddock is a great conchologist. In his travels through the countries of the mermaids, he picks up many curiosities in the shell way. Not a few rare species have been discovered by him; and the ungrateful zoologist too frequently describes novelties without an illusion to the original discoverer. . . . . Like the haddock, the cod also is a great naturalist; and he, too, carries his devotion to our dear science so far as occasionally to die for its sake with a new species in his stomach, probably with a view to its being described and figured by some competent authority."

The best way to get these often abundant treasures from their efficient but hapless collectors, is to enlist the services of the fishermen and ask them to save the stomachs. The work of opening and searching these is not nearly so disagreeable as would be imagined, and all conchologists must sooner or later come to it. There will be many disappointments, but also there will fall to the searcher's lot many rare shells and echinoderms, particularly of small forms, which the dredge would never bring up. The method has the advantage also of being inexpensive, and it can be followed at all seasons.

So much for collecting sea-animals. If we may tax the patience of the readers of the REVIEW a little longer, we shall in the next number endeavor to tell them how to preserve their spoils, and how profitably to study and use them.

Harvard University,
Cambridge, Mass., May 27.

For the REVIEW.]

Notes for Teaching Music by the Tonic Sol-Fa Notation.

SEVENTH PAPER.

In the first step we dealt with the notes of the DOH chord, in the second with the notes of the SOH chord, and in the third with the notes of the FAH chord. On looking at the modulator we see that these chords have two tones between the first and third, which is called a major third, and so these are called major chords. The other chords, RAY, ME, LAH and TE, have one-and-a-half tones between their first and third, or three semi-tones. This is called a minor third, and these chords are called minor chords. The major chords sound smoother and sweeter than the minor chords. It is well to let the class feel this, if the class can be got to sound the notes of a major, and then of a minor chord, in sections, one section listening, the other singing and giving the chord.

FOURTH STEP.

We may now go on to the fourth step, which takes up *Transition*, that is, passing over in the course of a piece of music from one key to another, and then generally returning again to the original key. The simplest form of transition is when the bridge note in which we pass from the original key to the new key is the key note or the d of the new key. The mechanical part of this form of transition is gone through when we pitch a tune using the scale of C as the standard scale. Thus, for key G we strike C^1 and sing d^1 s, and call s doh, then sing the chord of the key of G, doh, me, soh, me, doh, soh$_1$, doh. For key F we go to fah, call it doh; for key E we go to me, and call it doh, etc. Remember this and it will make the first part of the lesson on transition simple. Give the class C^1, and get them to pitch and give the chord of the keys G, F, E and A. Keys D and B may be left out meantime, as it is slightly more difficult to pitch them. Note that the difficulty in transition is the difficulty of *thinking*; think carefully what you have to do and most probably you will do it correctly.

Teach transition always from the modulator and you will teach it simply and naturally.

The commonest and simplest form of transition is that corresponding to the passing from key C to key G and back to key C.

The change from key G to key D, from key A to key E, from key D to key A, from key E to key B, and from key B to key F sharp, are similar to that from key C to key G.

Let the teacher point on the modulator such an exercise as the following:

Key C.

d m f s d^1 t l s

Leave the modulator and tell the class to think Doh, the firm, bold note to that sound, and sing d; then go to the modulator and point on the right hand column d m r d t$_1$ d, and the class will sing these notes in the key of G. The class has mastered the first part of transition. Let the class do this several times. Then try another similar exercise, changing s into d. The return step may be mastered also easily. After singing the d leave the modulator, tell the class to think and sing Soh to this sound, and point now in the middle column s m r d t$_1$ d. After this has been done easily with several similar exercises, let the teacher put the music on the black board, explain that ^{s}d is the bridge note, tell them just to sing shortly soh and doh prolonged, to establish the key in the pupils' ears.

DOH	f
TE	m
LAH	r
SOH	d
fe	t$_1$
FAH	l$_1$
ME	l$_1$
RAY	s$_1$
DOH	l$_1$
t$_1$	m$_1$
l$_1$	r$_1$
s$_1$	d$_1$

The exercise will appear thus:

Key C.

| d m | f :s
| d^1 :t | l :s

Key G.

| ^{s}d :m | r :d |
| t$_1$:— | d :—

Key C.

| ^{D}s :m | r :d
| t$_1$:— | d :— ‖

The next step will be to write the music in the other form in which it is often found. The one given is the better method.

Below the notes underlined let the teacher write the notes

| s :t | l :s
| f e :— | s$_1$:— |

and ask the pupils to sing the exercise several times each way.

J. ANDERSON.

The teacher must know how to enter into the hidden recesses of the youthful mind, and from that point work outward and upward. The pupil is like a treasure in the sea, and the teacher like a diver who goes to the bottom to bring it up. If you do not descend and ascertain first exactly where the child's mind is, you will not bring him up where you are. The descent of the teacher is essential to the ascent of the pupil.

For the Review.]

The Kinder-Symphony Club.

Anything with *kinder* attached falls pleasantly on my ear, so in spite of rain and a thunder storm I gladly availed myself of a kindly escort and attended the rehearsal of this interesting club, composed of children ranging from *four* years old. The larger number would be from eight to twelve. The *concertmeister* was a lad of fifteen, who conducted with an interest in his work so absorbing as to rule out self-consciousness—the bane of art. When I entered they were in full swing on a symphony of Chawtska's, which, while adapted to a child's comprehension and executive ability, was correct and finished.

Now for the instruments composing this unique orchestra: eight violins were played by boys, and four by girls; the unpropitious weather probably accounted for the absence of the cello and bassoon; the trumpet of four notes in C, quite a small one, rang out its solo notes of invitation with vim and precision, and from time to time penetrated the waves of sound with its clear, upspringing tones. A toy flute, a tube of six inches long, each end covered with thin parchment, added a soft, rich bass, not unlike that of a good *stop diapason* in a pipe organ. All these were accompanied by bells, rattles, triangles and castanets, swung, shaken, and struck in rhythmic cadence by children too small or uninstructed to use more ambitious instruments, but not too young to enjoy, *as a whole*, the music to which they intelligently brought their little share *con amore.* Two others, (shall we call them instruments?) in addition to the piano, were used: they were a "sleigh" and "whip," so called, the simplest contrivance possible. The "sleigh" consists of two pieces of wood, covered with stiff cartridge paper, the back of each furnished with a small wooden knob to hold it by. The effect produced by rubbing them together is like that of gay, dancing feet on a sanded floor, and was capital in the dance part of the symphony. The "whip" consists of two polished pieces of wood about 15 inches by 3½, hinged securely at one end, each side having a brass handle in the middle, by which it is held. It is opened and shut more or less widely, and with varying rapidity, so as to adapt itself to the rhythmic progression of the music, which gains wonderfully by these appliances, so simple that any handy person could easily make them.

Three points struck the mind with peculiar force:

1. That while musical expression is confined to a small and privileged class, and restricted to a certain conventional routine, we shall never begin to understand its infinite richness and diversity. To know what music really is we must study with painstaking care the sounds, common and uncommon, of the world around us, and learn to eschew that vulgar fallacy which rejects the small and unpretentious. Of all the arts, painting alone, at present, takes the commonest materials—for what are the best pigments but dirt dug out of the earth—and glorifies them by appropriate use at the hand of genius.

2. That no art can attain its grandest development that does not rest on a basis simple and broad enough to be a medium of expression for the great mass of the common people.

Man alone has *art*, and art, to be full-blossomed, must deal out its portion, in due season, to the weakest and smallest capacity. However high art may soar, the roots that nourish it must penetrate down into the humble earth and draw its sustenance from the most primitive elements.

3. That in the great world of musical art there is a place for the *little child*, and that without his feeble efforts, gaining strength and beauty by repeated attempts, art itself misses something which impairs its full expression and creates a sense of loss. But to avail ourselves of that free inventiveness which the child, once fairly started, will bring to music, we must condescend wisely and tenderly to their low estate, and adapt ourselves with humility to his comprehension. What treasures remain hidden in the unexplored field of childhood we have yet to learn. Suffice it to say that those who know most intimately child nature are those who respect it most profoundly.

When we looked into the kindly, earnest, German face of Mr. Trost we saw one reason for the success of this club in his patient assiduity. From Mrs. D. T. Ballard's fertile brain and loving heart sprung the idea of this "Kinder-Symphony Club." With womanly insight she believes in the child and its capabilities. Through her the comfortable hall in which they practise was swept and garnished for their occupation. The club gives a symphony concert next Friday, June 20th. It is to be hoped that a large and appreciative audience will reward the efforts of these small but clever performers. C.

The true value of a teacher is determined, not by what he knows, nor by his ability to impart what he knows, but by his ability to stimulate in others a desire to know.

The teacher whose mind shall not become a desert, must drink daily from the fountain of his calling. Forty eager pupils cannot quench their thirst for knowledge by looking at an empty vessel.

N. B. Educational Institute.

The twelfth annual session of the New Brunswick Educational Institute met at Moncton on Thursday, June 26th, at 2 p. m Chief Superintendent Crocket occupied the chair. At the first session 177 teachers were enrolled as members. The following shows the number of representatives from the different counties: Westmorland, 76; St. John, 35; York, 14; Albert, 14; Northumberland, 12; Kings, 11; Charlotte, 6; Kent, 4; Carleton, 3; Gloucester, 1; Victoria, 1. Further enrolments of members, with trustees and others interested in educational work, swelled the number to over 200. The first afternoon was taken up with routine work. The secretary-treasurer's report showed a balance of funds on hand from the past year of $28.92. A communication was read from the Chief Superintendent stating that the Board of Education declined to make any change in Regulation 23-3, making membership in a county institute a requirement of membership in the Provincial Institute. The committee on change of school terms reported that they had not been summoned to meet the Board of Education. The Chief Superintendent stated that owing to the difficulty of securing meetings of the Board during the year, no opportunity of calling the committee to meet the Board of Education had occurred. The committee was asked to continue its labors. A clause in the executive committee's report, that the election of officers take place at the first session was amended so that they may take place at the second regular session. A resolution, introduced by Superintendent Hayes, conveying the hearty sympathy of the Institute to Inspector Wetmore on account of his serious illness, was unanimously adopted.

The public meeting at the Opera House in the evening was largely attended and enthusiastic. Chief Superintendent Crocket presided. Mayor Sumner, on behalf of the city, extended a welcome to the visiting teachers; and to this the chairman made a suitable reply. Addresses on the various phases of educational work were delivered by President Harrison of the University of New Brunswick, President Inch of Mt. Allison, Dr. Bailey, Chairman Robinson of the Moncton School Trustees, Mrs. MacFarland of the W. C. T. U., and Hon D. L Hanington. The Moncton Cornet Band, and a select choir under the leadership of Mr. Wetmore, furnished an excellent musical entertainment.

Second Day's Proceedings.

The second session of the Institute met at 9 o'clock, a. m., on Friday. On account of the unfavorable weather it was decided to abandon the excursion to Shediac. G. U Hay, the New Brunswick editor of the Educational Review, advanced the claims of the organ upon the attention of teachers and trustees, and was followed by Principal Mullin of the normal school in complimentary references to its utility. While it lacked many important things in order that it could be made a paper for all classes of teachers, it is incumbent upon teachers to send literary contributions, criticisms, and in short all that would tend to make it a useful means for the dissemination of educational literature.

The report of the committee on changes in the constitution recommended that the constitution be so altered as to permit Teachers' Institutes, through a special committee, to offer suggestions to the Board of Education, respecting adaptability of text books and qualification and training of teachers, and that the Board of Education be asked to reconsider the decision that only members of county institutes be eligible for membership in the Provincial Institute. This was adopted, and the Chief Superintendent was asked to submit these recommendations to the Board of Education at its first meeting.

J. G. A. Belyea, Principal of the Shediac Grammar School, read a paper on the "Study of English in Advanced and High Schools."

He referred to the neglect of this study in the past, and held that such neglect arose from the mistaken idea that if the pupils knew how to speak English no further study was necessary or educative. It was also a mistake to think that English could best be studied by studying some other language. English required a scientific study and was capable of being thus dealt with, and nothing short of that would do.

The neglect of the study of English is seen in the lack of appreciation of the best class of literature and the mixing into the language of cant phrases, slang, vulgarity and profanity.

He advocated the study of the sentence first, and that sentence to be taken from the reading lesson. As the English is specially adapted to the processes of logical analysis, this exercise can be taken up first. The study of grammar should be taken up with a strong leaning to mercy, as the grammar is better fitted to a language of inflected forms, such as Latin, rather than the differently constructed English. The study of grammar throws no light on the meaning of words or sentences. Analysis does; and it requires the best thought and power of the pupil, and is thus very educative; and a pupil who is in the habit of using such methods has a decided advantage over one not so trained.

The study of etymology was strongly urged as being both interesting and educative, as well as throwing a strong light on the meaning of words. In the higher stages of the study of English the more formal examination and study of English should be taken up, and a careful analysis of the thought and style, and an examination of the history of the author of that portion of literature under consideration, would furnish a highly beneficial series of exercises.

The benefits of such study were clearly shown and the adoption of a text book for higher classes on the history of literature, with the biographical sketches of the principal authors was thought to be of advantage when used in connection with the study of the work of the author.

An interesting discussion followed, in which the following gentlemen took part : Messrs. Hay, Montgomery, McLean, Parlee, Belyea. The points made were that English composition and the reading of good English authors should be begun in the lower grades and carried on to the higher grades without interruption; and that the principles of grammar and analysis should be introduced gradually and without a text book until the higher grades are reached.

At the conclusion of the proceedings of the morning session the members were photographed from the front of the Methodist church, in the basement of which building the sessions of the Institute were held.

In the afternoon a resolution was adopted, moved by Philip Cox and seconded by John Montgomery, that such legislation should be asked for as would enable the Institute to elect annually one or more representatives to the senate of the University of New Brunswick.

A resolution in favor of the Educational Review moved by Charles J. Morrison and seconded by E. A. Pearson was also adopted as follows:

"That we, the members, convened in annual session of Provincial Institute, recognizing the necessity for such a means for the propagation of educational principles, do express our appreciation of the energy and zeal of the editors and contributors, and urge upon the members of the Institute the advisability of giving to the REVIEW their hearty support and co-operation."

Mr. F. O. Sullivan, of St Stephen, in his paper on "A Scheme for Promoting Pupils in Graded Schools where there is no Local Superintendent; and, Should Advancement be Determined wholly by Written Examinations?" said, after discussing the several ways in which grading is done, that the young, ambitious and inexperienced teacher, as well as the older ones, want a fair, honest and satisfactory scheme for promoting pupils, a scheme that will be just to the pupil and fair to the teacher of the grading class, as well as the teacher into whose school the class is graded. Such a scheme is that reached when the teacher of the school or grade above examines the class that is expected to grade into his school. Currie, in his manual, says, "The first object of the teacher's questioning is to find out precisely the extent of the pupil's knowledge of the subject. What he has to communicate must be joined on to what the pupil already knows." The teacher in the grade above must be the one to find out where the joint should be made. He has a practical knowledge of what he is doing. He knows where his work should begin and what amount of preparation for it is required of the pupil. He is anxious that the school should in no wise suffer from any negligence or over exactness on his part. It is therefore his aim to see that the best interests of the pupil and the school are properly attended to. With that feeling predominating his examination will not be hurried, but will be such as to fully convince him of the number fitted to grade. In case of a doubtful pupil, the teacher of such pupil may be consulted. The teacher of the school should promote his lower grades.

I take it for granted that every locality has a fixed standard as a basis for grading. That standard must not be too high. It should not be more than sixty per cent nor less than fifty per cent. Such averages as seventy-five or eighty per cent should never be required as a minimum pass mark.

The importance of written examinations is recognized in the several professions, in all branches of the civil service, in the different colleges and universities, as well as in our normal schools. Knock at the door of whichever of these institutions you may, the first struggle to gain admittance therein is with a written test examination. Through worry and nervousness pupils often fail to do themselves justice, when they have not been accustomed to written examinations. Success can only be gained by practice. It is the aim of our common schools to fit a boy, to a certain extent, for the activities of life; that is, his time should be so employed, and his talents so directed as to be of the greatest benefit to him in order that when he leaves school he make the most of himself. Then with such an end in view, and with a knowledge of the almost universal use of written examinations, practice in them should be begun perhaps as early as the fourth grade of our common school course In all the grades between the fourth and eighth the written examinations should include most of the subjects laid down in the pupil's grade work for the year. The eighth grade examination should, however, be wholly written, for the pupil will, if he continues his studies, meet test examinations at whatever institution he may attend.

Considerable time is saved by written tests. It would require several days to examine an ordinary class orally. The work would be done by examining the pupils individually. The test would not be so satisfactory. For a look or a hint from a teacher, though it may be involuntary, will often decide the pupil's course in answering. Greater latitude will be allowed in answering orally than in a written answer. The examinations for advancement, therefore, should be wholly written as soon as it is at all practicable, because they afford a better test of the pupil's knowledge; they prepare him for future school work and occupy much less time than oral examinations.

The paper evoked considerable discussion by teachers of graded schools, in which Messrs Barry, W T. Kerr, Belyea, R. P. Steeves, Wilbur, Montgomery, and the Chief Superintendent took part.

The following officers were elected for the present year: Secretary, H C. Creed, Fredericton; Assistant Secretary, Wm. C. Simpson, St. John; Executive Committee, Philip Cox, Geo. U. Hay, Samuel C. Wilbur, James M. Palmer, W. H. Parlee, George J. Oulton, Wm M. McLean, James Barry, Berton C. Foster, Samuel W. Irons.

A paper on Natural Science, illustrated by experiments, was read by John Brittain, of the Normal School staff. Mr. Brittain's paper was full of practical suggestions for the proper instruction of pupils in the common plants, animals, and minerals of the provinces. He called attention to the profound ignorance of the great majority of children, and in many cases grown up people, concerning these. He attributed the fault to the fact that our text-books are not suited to the times, nor is the phraseology of the books adapted to the capacity of the pupils. The reading of some sentences in "Palmer's Teaching of Science," which were only comprehensible by those who had spent years of study in science, provoked considerable laughter, as that text-book is supposed to be read and properly understood by pupils from eight to twelve years of age.

During Mr. Brittain's address, two young ladies, recent graduates of the Normal School—Miss Galt of Moncton, and Miss Hanington of Shediac—prepared and illustrated the properties of carbon dioxide; and Mr. Perry, Mr. Robertson, also recent graduates, prepared oxygen gas, illustrating some of its properties. These experiments were deftly and intelligently performed. At the conclusion of Mr. Brittain's admirable address, addresses were made by Messrs. Cox, Hay, and the Chief Superintendent.

Mr. W. H. Parlee, on behalf of the committee on the superannuation of teachers, asked for further time to prepare a suitable report.

At the last session of the Institute on Friday evening, a select choir under the leadership of Mr Wetmore, kindly furnished music. Inspector Bridges read a paper on "Patriotism, how it can be Developed in our Common Schools." He said there were no more patriotic members of any profession to-day in the province than the teachers, but among the already lengthened chain of obligations that pressed almost too heavily upon them, the development of the patriotic sentiment among the pupils remained sometimes among those that were unfulfilled, and the object of his paper was to renew within the teachers' mind their duties in this direction It was through subjects already in our course of instruction—such as reading, composition, singing, and emphatically history and geography—that this object was to be accomplished. The pupil should know as soon as he begins studying the history and geography of Canada, that it is of *his own* country he is becoming acquainted with British history should always receive careful attention at the hands of the teacher. The children of a people, the majority of whom are descended from English, Scotch and

Irish, and who are united together in this country by common interest, should know the history of their ancestors and their struggles for freedom.

Canadian history had been in our course less than sixteen years, but much progress had been made in the study. Through this the Acadian learned of his ancestry and country, which had been his for generations past. The study of civil government in our schools should be emphasized. Still more was it to be hoped that in the near future only one history might be used throughout the length and breadth of this Dominion. Until this was accomplished, the full development of patriotism through our history as a study would not be attained. For the very same purpose a national reader was a necessity. The benefit of singing good patriotic songs in our schools could not be over-estimated. Our pupils should have national songs. Things learned by writing about them are not soon forgotten. The pupil should be made to write compositions from time to time upon periods in our history, and the Montreal *Witness* deserves great praise for its action in this direction.

An accurate knowledge, in the mind of the pupil, of the vast extent of our territory, its illimitable resources, its healthful climate, and the beauty of its natural scenery, was essential to the free development of patriotism in our common schools. So many of our resources have only lately been discovered, and part of the country has grown so rapidly, that our text-book on geography did not furnish sufficient data. The live teacher must then look beyond this to statistics and recent magazine articles. It was estimated that there was in Canada 700,000,000 acres of land fit for cultivation, or a territory about equal to the arable land of the United States. In her wealth of forests and fisheries, Canada possesses resources greater than any other country in the world, and the discoveries of her mineral wealth was hardly yet complete and not begun to be appreciated.

Annexation had gained no foothold among our Canadian people, and it was not for the teacher to refute the spread-eagle oratory of Yankee politicians in this direction. Charles Dudley Warner, in his comments on Canada, spoke as follows: "Annexation if put to a popular vote would make little or no showings in the returns, and there were forces strong enough to keep Canada for a long time on her present line of British connection." Erastus Wiman said, "In no part of the British empire is loyalty to British institutions more pronounced than in Canada, and if there is any one sentiment that universally pervades the Canadian people, it is this sentiment of loyal adhesion to British connection, pride in British traditions and personal devotion to their sovereign."

It would be well for teachers to celebrate in some way our public holidays. The exercises last 24th of May at our Provincial Normal School and the pleasure manifested by student-teachers in their display of love of country and Queen formed a happy incident in this connection, and it would have a great influence for good in inspiring patriotic feelings among pupils if above every school-house, upon these public holidays, the flag of our country might be seen floating in the breeze.

Mr. Philip Cox, who was appointed to open the discussion, read a paper which abounded with patriotic sentiment. The state ought to demand in return for the care and education of its children patriotism and protection against the innovation of alienating sentiment. Our text books should have a thoroughly Canadian tone, but not prejudicially so, and some idea of the sacrifices made by our forefathers should be taught.

The Chief Superintendent expressed his hearty approbation of all contained in the papers of the gentlemen, and strongly advocated text books adapted to our especial needs.

Mr. John March of St. John gave an interesting talk on "Hints on Teaching Geography." Mr. March first dwelt on the importance of the study of geography. It should begin as soon as consciousness in the child begins. The individual soon realizes a world outside itself. The school-room is its world, then the town or city, then the country, then the nation, and the world, a part of the universe of God. The interest in things about it and use of those things next were dealt with by the speaker. He suggested that teachers make maps; many perforated are now used. He would not use text-books but use newspapers. Hon. Geo. Hibbard's little text-book on geography might be read with considerable interest and profit. He also exhibited an analytical chart made by himself and explained its use.

The executive committee submitted a resolution conferring honorary membership on Sir Leonard Tilley. It was unanimously adopted. Votes of thanks were tendered Mayor Sumner and city council for use of the opera house for the public meeting; to Mr. Wetmore and the Methodist choir for music; to railways and steamboats, to the pastor and trustees of the Methodist church for use of the vestry, and to the writers of papers.

S. P. C. A. Column of Review.]

The Dog-Soldier.

By David Ker.

"Who brought that dog here? Send him back at once."

So spoke, in his deepest and sternest tones, old Colonel Eugene Noirmont, as he rode out of the French fort at Biskra, in the Sahara Desert, at the head of a strong body of irregular cavalry, which had be sent to check the raids of a hostile Arab tribe.

"He is my dog, Colonel," answered the junior Captain, young Alphonso de Picardon, glancing apologetically at the small white poodle that was close at his horse's heels; "and I hope you will not object to his going with us, for it would break his heart to be left behind."

"And whose heart will it break," growled the Colonel, "if the brute begins barking just as we're going to take the Arabs by surprise, and warns them of our coming?"

"It is not for me to contradict you, Colonel," said the young officer respectfully; "but, with your permission, I can soon show you that there is no fear of that." Then he turned to the dog and said sternly, "*Jacquot, silence a la mort!*"

Then, at a sign from the Captain, several of the men began to shout, clap their hands, and make noise enough to set an ordinary dog barking furiously, but Jacquot never uttered a sound.

"Very well," said the Colonel at length, "the dog may go; but remember, Captain de Picardon, that I shall hold *you* responsible for his behaviour."

The young Captain saluted, and fell into his place without a word, and off rode the detatchment.

It was weary work riding over stony ridges and sandy hollows, through the blistering heat and the blinding glare, while the hot prickly dust rolled up in clouds at each step, clogged every pore and choked every breath. Mile after mile of the desert was left behind, hour after hour of the burning. weary, interminable day crept slowly past, but still there was no sign of the enemy, or of any living thing save a wide-winged vulture, which hung poised in mid-air, like a blot upon the bright, scorching, cloudless sky. The soldiers grew impatient, and began to murmur and growl.

But all at once the dog (which was still keeping pace with them) stopped short, snuffed the air uneasily, and then began to run restlessly backward and forward, uttering a low anxious whine.

"Do you think he scents the enemy, whispered Colonel Noirmont to Captain de Picardon.

"I'll stake my life he does," replied the Captain. "I've never yet found him wrong. There must be some hollow here that we can't see. Here, Morel, Barbot, hold fast to each other, while I climb on to your shoulders."

And then, supported by the two burly troopers, he raised himself high enough to make out a dry water course a few hundred yards ahead, in the hollow of which a large number of men might easily be hidden.

"Ah!" cried the Colonel, when he heard this, "they want to catch us in an ambush, do they? Not so fast, my fine fellows! Half a dozen of you dismount, lads, and unsling your carbines, move forward about fifty paces and then fire."

The crash of the volley rolled like thunder along the silent desert, while the Colonel roared, in Arabic: "Come out, you dogs! We see you plainly."

The effect was magical. Up started, as if rising through the earth, a swarm of savage faces and wild figures, while the flash and the crackle of the answering volley followed as thunder follows lightning; but the Arabs firing hastily and almost at random, only wounded two men.

"Now," thundered the Colonel, "upon them before they can reload."

Down swept the French upon their enemies like a whirlwind, and in a moment were hand to hand with them The Arabs fought like tigers, but training and discipline soon began to tell, and the battle was over (as one of the French troopers regretfully observed) "almost before one had time to enjoy it."

But when the Arabs began to scatter and fly, the Colonel (whose blood was fairly up) dashed off in pursuit of them so recklessly that he was soon left almost alone, seeing which three of the enemy faced round and attacked him.

Captain de Picardon—who was famous as the best swordsman in the regiment—came dashing up barely in time to cut down one of Noirmont's assailants, while the Colonel himself disposed of another; but the third man was just about to stab de Picardon in the back, when his dog flew at the Arab's throat, and clutched it with such hearty energy that the man fell to the ground bleeding and half strangled.

"Form in line!" shouted Colonel Noirmont, when the fight was over, and all the wounded had been brought in. "My children, you have done well, and I thank you. To-morrow you will be reported for good service to the commander-in-chief himself, and *he* will not forget you; but I have one acknowledgment to make before that. Captain de Picardon, bring forward your dog."

The four-footed scout was at once produced, and when set down in front of the Colonel, he stood up on his hind legs and made a military salute with his fore paw, to the unbounded delight of the soldiers.

"A soldier who knows his duty so well," said the Colonel, with a grim smile, "must not go unrecompensed, and thus I reward his services."

So saying, he detached from his own uniform the cross of the Legion of Honor, and hung it around the dog's neck amid thundering cheers from the assembled troopers, who declared with one voice that his decoration had been fairly won by their "Dog Soldier."—*Harper's Young People.*

PERSONAL.

We understand from Amherst papers that inspector E. J. Lay has been offered the Principalship of the Mt. Allison Male Academy. This is a very practical comment on our article of last issue. No better appointment for Mt. Allison could probably be made we are convinced. But we hope our public school system is not of the kind which will allow universally recognized merit in one of its officers to be the occasion of his loss to the service, just for the lack of a remuneration which a private institution could afford to offer.

We clip the following from our exchanges with very much pleasure:

Ed. Fulton, B. A., 1889, with first rank honors in English and history, and F. J. McLeod, B. A., 1890, with first rank honors in Greek and English, have been awarded scholarships called the "Price Greenleaf Aid" at Harvard. Also A. S. McKenzie, B. A., 1885, with honors in mathematics, a tutor at Dalhousie college during the sessions of

1887–9, has been awarded a fellowship at Johns-Hopkins university in physics. Thus doth Dalhousie prosper!

Miss Eliza Ritchie, who graduated from Dalhousie College in 1887, with first rank honors in mental and moral philosophy, and afterwards took the degree of Ph. D. at Cornell University, has just been appointed Associate Professor of Psychology and History of Philosophy at Wellesley College, Massachusetts.

SCHOOL AND COLLEGE.

The closing exercises of the St. John schools took place on Wednesday, June 25th, and were attended by a large number of visitors who manifested a lively interest in the proceedings. The attendance of pupils during the past term has been very large, and under the supervision of Secretary March and Supt. Hayes the results have been in a marked degree satisfactory. At the Grammar School the pupils were reviewed in the work of the term. The Corporation gold medal was won by Frank Green; the Parker silver medal by W. Clark, and the bronze medal by Charles Manning. At the Girls' High School a crowded house, brilliant decorations, and unusually interesting exercises marked the closing. The valedictorian and winner of the Governor General's silver medal was Miss Margaret Morrow. Eleven young ladies of this school entered for and passed successfully the matriculation examination of McGill University, and seven the matriculation examination of the New Brunswick University.

The increased accommodations at St. Francis Xavier College, Antigonish, due to the extension of the buildings described in a former issue, have contributed to make the year just closed one of the most satisfactory in its history.

At the Centenary of King's College Windsor, a great number of complimentary degrees were conferred upon ecclesiastics ond others, among whom we are pleased to notice Professor Kennedy of Kings as a D. S., and President Forrest, D. D., F. S. Sc., (Lond.) as a D. C. L. An increased attendance of matriculates is expected. An effort is also being made to establish a boarding school for ladies coordinate with the boy's school.

Halifax has many private schools of special excellence. Of these we may mention the Arnold School, under Principal Waddell, which closed for summer holidays June 26th. Special training for the various public examinations, such as for the preliminaries of medicine, law, military college, etc., is given here with much success.

The convents of the Sacred Heart and of Mount St. Vincent closed with magnificent exhibitions, the accounts of which filled about two columns each in the daily papers.

Saint Patrick's High School, Halifax, is winning for itself a high reputation for the thoroughness of the work done by it, to judge from the reports of public examinations and the results of competitive examinations.

Acadia College has been made the happy recipient of an endowment to establish a new chair in political economy. The Alumni are establishing a new chair in physics. The friends of Acadia show an intelligence and an energy which would appear to give them the first place as patrons of education in these provinces.

The Governors of Dalhousie have issued an appeal for $50,000 to meet the present annual deficit in the running expenses of the Institution.

BOOK REVIEWS.

First Greek Grammar Syntax, by W. Gunion Rutherford. Publishers, MacMillan & Co., London and New York. This little work aims to take up the main points in Greek syntax, and present them in clear and logical order to the student. The book is well printed, and is a valuable addition to the MacMillan's Greek Series.

Elements of Structural and Systematic Botany, by D. H. Campbell, Ph D., Professor of Botany in the Indiana University. Publishers, Ginn & Co , Boston. This, as the author states, is not a complete treatise of the whole science, but an introduction to the study for use in High Schools especially. It aims, by the selection of types of many plants, especially in the lower forms, and of profuse illustrations of these, to form a basis for the intelligent study of this branch of natural science. One admirable feature about the work is that it aims to give a tolerably full and accurate knowledge of the plant, and how to study it by means of the microscope.

Robert Browning. A Memorial Meeting of the Syracuse Browning Club. Publisher, C. W. Bardeen, Syracuse, N. Y. This pamphlet contains many valuable articles on the study of Browning, viewing him as a Historian, a Religious Teacher, as a Help to Living, as an Artist, Philosopher and Dramatist.

Historische Erzahlungun. Tables from History, by Dr. Friedrich Hoffman, edited with notes by H. S. Beresford-Webb. pp 106, paper. (Boston, D. C. Heath & Co., 1890.) Hoffman's Tables from History, are some of the most interesting episodes written. This small volume will therefore be specially welcome to the German student, as he will be compelled to finish what he began. It contains the following four stories. I. Conradin of Suabia. II. The end of Charles the Bald. III. The Execution of Louis XVI and his Queen. IV. The Franco-German War (1870-1871).

BOOKS RECEIVED.

Harmony in Praise. D. C. Heath & Co., Boston, Publishers.

The University of King's College, Windsor, N. S., by H. Y. Hind, M. A., from T C. Allen & Co., Publishers, Halifax, N. S.

Publications Received.

Popular Science Monthly for July contains the following among other valuable articles: Antiquity of Man and Prehistoric Archæology, by Dr. Andrew D. White; an illustrated account of Greenland and the Greenlanders; Evolution and the distribution of Animals; Insect pests of the House (illustrated); Apparatus-making in Education. . . . *St. Nicholas* for July has a very striking frontispiece illustration and story on The Baby a Prisoner of War, with seasonable articles on Vacation Days, Cycling, Base Ball, How to sail a Boat, etc.

Syllabus of Preliminary Examination for Law Students Nova Scotia.

Latin: Translation, Grammar and Composition. Authors for 1890—Cæsar, *De Bell. Gall.*, Books II. and III.; Virgil, *Æneid*, Book II. For 1891—Cæsar, *De Bell. Gall.*, Books IV and V.; Virgil, *Æneid*, Book II. For Virgil, the candidate may substitute either the Institutes of *Justinian*, Book I., or the Commentaries of *Gaius*, Book I.

Greek: Translation, Grammar and Composition. Authors for 1890—Xenophon, *Anabasis*, Books IV., V. and VI. For 1891—Xenophon, *Anabasis*, Books V., VI. and VII; or

French: Translation, Grammar and Composition. Authors—Voltaire, *Charles XII.*; Moliere, *Le Bourgeois Gentilhomme*, etc. To translate easy authors or newspapers at sight; or

German: Translation, Grammar and Composition. Adler's German Reader. To translate easy German at sight.

Mathematics: Arithmetic, as in *Hamblin Smith's*; Algebra, as in *Todhunter's* Algebra for Beginners; Geometry, *Euclid*, Books I., II., III. and IV., with easy exercises.

English: Grammar, Analysis and Composition, as in Nova Scotia prescribed text books for the public schools. Critical study of Shakespeare's plays. For 1890—*The Merchant of Venice* (Rolfe's edition recommended).

History and Geography: British and Canadian History, as in Nova Scotia prescribed text books for the public schools; General Geography, as in the prescribed text book, *Calkin's*.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

Zoology, 8 lectures—By Principal A H. MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.
Botany, 8 lectures—By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.
Mineralogy, 8 lectures—By A J. Pineo, A. M, Truro; assisted by Miss Mary Dwyer, St Mary's School, Halifax.
Physics, 8 lectures—By Principal E McKay, New Glasgow.
Chemistry, 8 lectures—By Prof. A. E. Coldwell, Acadia College, Wolfville; assisted by W. T. Kennedy, Esq., Halifax Academy.
Physiology, 8 lectures—By Prof. Burwash, Mt. Allison College, Sackville.
Geology, 4 lectures—By Prof. Kennedy, Kings College, Windsor.
Astronomy, 4 lectures—By Principal Cameron, Yarmouth Academy.
Tonic Sol-fa—Miss A. F. Ryan, St. Mary's School, Halifax.
Elocution—By Miss H. E. Wallace, Acadia Seminary, Wolfville.
Modern Languages—By Herr Lothar Bober, Halifax.

It is only in very exceptional circumstances that teachers and science students can take a holiday excursion so cheap, so profitable, and so delightful and refreshing as that here offered. Class fees from $2 00 to $6 00; board, $6.00, with free or one-third return tickets For a person living 100 miles from Parrsboro, $15.00 will easily cover necessary expenses—including apparatus, etc.

Laboratory and Field work will be made the basis of all the science teaching.

There will be an opportunity of acquiring a theoretical and practical knowledge of Tonic Sol-fa

The talented elocutionist of Acadia Seminary has consented to give a course of lessons on "Voice Culture and the Teaching of Reading."

Herr Lothar Bober, whose classes include the leading educationists of Halifax and Truro, and who is most favorably known in Fredericton and St. John, will illustrate the true method of acquiring a conversational mastery of modern languages.

The attention of teachers and science students in the Maritime Provinces is invited to the professional and practical advantages of this Summer School.

For a calendar giving full particulars regarding text-books, their cost, apparatus, etc., recommendations from the lecturers, etc., address A. McKay,
Secretary Summer School of Science,
Halifax, 7th February, 1890. Halifax, N. S.

McGILL UNIVERSITY,

MONTREAL.

The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 15th. 1890).
Donalda Special Course for Women—(Sept. 15th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). ' Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
Faculty of Medicine—(Oct. 1st).
Faculty of Comparative Medicine and Veterinary Science—(Oct 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.) J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

DOUBLE NUMBER.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., AUGUST AND SEPTEMBER, 1890. $1.00 PER YEAR.

A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
G. U. HAY, Ph. B., Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

TO OUR READERS.

READER, a word with you. The REVIEW is in its fourth year. It has successfully passed its second and third years—fatal periods for less enterprising periodicals. Its circulation has gone from the hundreds into the thousands—slowly but steadily. This special edition numbers FIVE THOUSAND copies, and will have, it is safe to say, FIFTY THOUSAND readers, chiefly in the Atlantic Provinces of Canada.

Of the five thousand teachers collectively in Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland three-fourths should be subscribers to the REVIEW. This leaves a very liberal margin of those who may prefer other educational papers, or of those who do not take any educational paper, and whose only ambition is to get out of the profession as soon as possible or to linger in it with imperfect methods or no methods at all,

We have been modest in setting forth the claims of the REVIEW. That it has claims upon our teachers for their support cannot be denied. It is published for Atlantic Province teachers and in their interests.

We have two requests to make of our readers: First, will those who receive a copy of the September number enrol themselves as subscribers, if they have not already done so. If you do not wish to subscribe hand the copy sent you to some one who may wish to become a subscriber. Do not return the copy. We have no use for it. Secondly, will those who are already subscribers pay no attention to the circulars enclosed unless they are in arrears.

The testimonials that we receive every week from our best teachers show that the REVIEW has already become a power in our educational development. With the plans we have in view for its further improvement this year, it should receive increased support. It costs *eight* cents a month. Can any teacher afford to be without it at that price?

Without an organ of inter-communication there can be first, no community of thought or sentiment; and secondly, no harmony of action. And under what more favorable circumstances could a paper for the teachers of these provinces exist than the REVIEW holds at present? Its editors and proprietors are as independent of the governments and government officials of the various provinces as it is possible for men to be. They are also engaged in the active work of teaching, and in that respect no sounder condition can be imagined. Yet there are some counties in which but comparatively few of our teachers have yet found out the necessity of maintaining such an organ, and are probably not aware of its existence. This number we hope all without exception may see.

But it may be retorted, you are independent of the government and are practical teachers, why then have you not hurled thunder-bolts at the governments of Nova Scotia and New Brunswick for cutting down the provincial grant to teachers while the members increased or kept at their former figure their own salaries? For two reasons: We have been waiting for the governments to see the pettiness of the reduction made and, man-fashion, make restitution; second, we have been waiting for a united sentiment on the part of our teachers — a spirit of action, not a tameness that makes them always a target for the pruning process.

There should be more of an *esprit de corps* among our teachers, a spirit born of firmness and resolution to stand up for what is just and substantial; and that may mean an increase of salary and it may mean an energetic and dignified insistence upon what is just and proper to a profession that should have very strong claims upon society. And if some teachers do not care at all for their rights and decline to insist upon them perhaps they are not to be pitied if they suffer not only a reduction of the grant but a total annihilation of it. But such a tame and do-nothing policy causes both a direct and indirect injury to the unselfish and qualified teachers in the profession. If such a policy characterized our teachers to any extent, we repeat it, they would deserve to be despised and docked of salaries and privileges without any consideration whatever. But we belong to a profession that numbers in its ranks men and women of character and standing, and their influence should be exercised with more directness and energy. The aim of the REVIEW has always been not to foster a spirit of discontent that will vent itself in grumblings, but to arouse a greater respect for the profession of teaching, and keener sympathy and more united aims of those engaged in that profession.

When teaching is entered upon as a life work; when men and women, properly qualified, undertake the work with an unflinching purpose to succeed, then success will be certain. But the aim must be high, a high value must be set upon the office of the teacher. At the outset, they must realize that intelligence, tact, industry, faithfulness, are just as certain of rewards in this as in other professions. When this is fully realized, the public will not be slow to yield a more ample recognition and greater material benefits.

EDITORIAL NOTES.

THE University of New Brunswick will open on the first of October with a strong faculty, and, for the first time in its history, with four classes of undergraduates. Prof. A. W. Duff, who sailed from Liverpool on the 2nd of September, will deliver an inaugural address on the utility of a chair in experimental physics, which chair he will occupy at the University. The Senate instructed him to purchase, before leaving Liverpool, $500 worth of apparatus for his department. Prof. Stockley, of the department of English and modern languages, has been given leave of absence for one year to engage in literary work, which, it is understood, is the editing of Moliere's Plays, to be published by a New York house. Prof. Douglas Hyde, LL.D., of Trinity College, Dublin, will occupy Prof. Stockley's chair the coming year. Dr. Hyde is a distinguished scholar, having been highly recommended by Professor Dowden of Dublin University, the celebrated Shaksperian scholar. Dr. Hyde was senior moderator and gold medallist in English and German, first honor man in French, Vice-Chancellor's prize-man in English prose and verse in 1887.

THE very pleasant relations established between the teachers of New Brunswick and Nova Scotia at the recent session of the Summer School of Science at Parrsboro has caused the management to decide to give the school an inter-provincial character in future. The next session will, no doubt, witness a large increase in the membership, both from New Brunswick and Nova Scotia.

THE New Brunswick normal school opened on the first instant with an attendance of nearly 200. The Nova Scotia normal school will open on the first of November. See the advertisement in another column.

WE would like to draw the attention of our readers to the books advertised in this number of the REVIEW. In justice to *all* the publishers who advertise with us, we have hitherto made it a point not to make special editorial mention of any *one* firm to the exclusion of the others. In this number we see many books advertised from which we know our teachers would receive many new ideas and great practical benefit. We invite them to scan closely the advertising columns, and then *act*. One of the most successful teachers in these provinces to-day is one who, at the outset of his career, was forced to practise the most rigid economy. But he never denied himself books. Whenever he saw a notice of a book which he thought would help him in teaching he procured it, and to-day he is reaping the reward of his wise self-sacrifice.

We will begin in the October number a series of papers on methods and appliances for teaching chemistry, by Mr. John Brittain, teacher of natural science in the New Brunswick normal school. The excellent work that Mr. Brittain is doing for natural science will tend to increase the interest and value of this subject throughout the provinces, and we are sure the teachers both of Nova Scotia and New Brunswick will heartily welcome the series of articles from his pen.

Many educational journals of the United States circulate freely in the Atlantic Provinces, and to the *best* of them we give a cordial welcome. The Educational Review numbers among its subscribers some influential teachers across the border. We are quite sure that they appreciate the Review as highly as do the teachers of the Atlantic Provinces; and to give others an opportunity to make the acquaintance of our journal, we send this number to nearly two hundred leading teachers in New England.

The academies, high schools or grammar schools of Newfoundland while not under a uniform management, as in these provinces, are turning out superior scholars, as is evidenced by the success of Newfoundland students abroad. Some of these institutions have a staff of instructors which would compare more than favorably with some degree-granting colleges we know of on this continent.

The educational display at the approaching exhibition to be held in St. John this month will probably be the most complete and extensive ever shown in New Brunswick. The schools of St. John, St. Stephen, St. Andrews, St. George, Fredericton, Woodstock, Moncton, Newcastle, Chatham, Douglastown, Hampton, Sussex, Elgin, Alma, and other places, will exhibit work, and the educational department will be one of the most attractive features of the exhibition.

The Prince of Wales College and Normal School, Prince Edward Island, was opened for the session 1890–91, on 25th August. The number of students in attendance is even greater than in previous years—138 having been enrolled. In future, botany and agriculture will be added to the subjects of examination for entrance, and papers of greater difficulty and wider scope will be set in English, Latin, and algebra. An advanced examination will also be held of those candidates who do not rank as second-class teachers but desire to study for first-class license in algebra, geometry, Latin, and French, as far as is required of those who compete for second-class license. Mr. A. E. Shuttleworth, B. Sc., McGill, and a graduate of the Agricultural College, Guelph, has been appointed to the Prince of Wales College. Besides being professor of agriculture he will also be instructor in chemistry and physics.

Professor Chas. G. D. Roberts, of King's College, N. S., has been engaged in translating a story of the fall of Quebec—*Les Anciens Canadiens*—by Philip Aubert de Gaspe. The story is full of interest, with strong local colorings, which the genius of Prof. Roberts will reproduce in the translation. The book consists of about 200 pages, and will be published by the Appletons of New York.

The prospect of the year's work at Acadia College, and the academies at Wolfville, are of the most encouraging character. With so many knocking at the doors of these and similar institutions, the prospects for higher education in these provinces were never better.

In spite of the fact that eight extra pages are printed with this edition of the Review, making thirty-two pages in all, we are obliged to hold over matter that should appear this month.

The Sackville Institutions have re-opened with a large number of students and with increased facilities for improving upon the work of previous years.

The P. E. I. Educational Association will be held at Charlottetown on the 2nd and 3rd of October. As will be seen by the advertisement in another column the programme is an excellent one. The indications are that educational work in the Island is making rapid advances, and we hope the success of the approaching meeting will amply verify these signs.

CANADIAN EDUCATIONAL CONVENTION FOR 1891.

The American Institute of Instruction, Ray Greene Huling, president, will hold its next meeting, beginning July 6th, 1891, probably upon the mountains of New Hampshire; the National Educational Association of the United States will assemble about a week later, probably July 13, at Saratoga. Would it not be well to hold a Canadian convention of teachers, to begin a week later, July 20, say at Montreal or Toronto?

The project of a Canadian educational convention has been frequently hinted at in the last few years. There would be many advantages arising from a meeting of the teachers of Canada — a meeting for introduction, at least. We know little or nothing of our fellow-teachers in Ontario and Quebec or the educational work of those provinces. Such a convention would bring together the teachers of the Dominion for the exchange of ideas and comparing notes on the different systems of education; it would widen the current of thought and enlarge the mental horizon of our educationists; it would give an opportunity to those teachers of eastern Canada who have sought their fortunes in the far west to pay a visit to their old homes; finally, it would be in line with the other meetings named above and give an opportunity to those who wished to do so to attend, at a moderate expense, all three meetings.

Let the beginning of the last decade of the 19th century be signalized by breaking down some of those barriers which have so long kept our teachers sectional and, therefore, narrow.

The following letter from Mr. Ray Greene Huling will be read with interest. Mr. Huling attended the Inter-provincial convention in St. John in 1888, and many entertain very pleasant recollections of his visit, not only on personal grounds but as the representative of the influential educational association of which he is now the president:

I am sure that all who participated in the delightful Inter-provincial Convention of 1888 will be glad to welcome the suggestion, now in the air, of a Canadian Educational Convention in 1891. And if that assembly should convene at Montreal, the National Educational Association at Saratoga, and the American Institute of Instruction in the White Mountains of New Hampshire, as is possible, what a veritable feast of good things the summer of 1891 will have in store for the lovers of educational progress in North America! It will need but a wise selection of specific dates, and liberal terms on the part of railroads and hotels, to give all three meetings a large and enthusiastic attendance from both sides of the line. For one, I shall take great pleasure in promoting within New England a hearty interest in the proposed gathering from all Canada. Nothing less would be a suitable return for the many kindnesses received by me in the Maritime Provinces three years ago.

Let me now say a word about the American Institute of Instruction. You know we claim that it is the oldest association of teachers with a continuous history in the world. Its first meeting, in the summer of 1830, was a remarkable gathering at Boston of more than three hundred friends of education from eleven different States, from Maine to South Carolina Every summer since has seen a similar assembly for three or four days discussing themes of supreme interest at the time to the immense advantage of education in the States. Over four hundred speakers, some of them the ablest thinkers on education in the land, have given their best efforts to the institute, and naturally the influence of his organization has been widely pervasive and efficacious for good. Leaders in education and in society have been glad to serve it as officers and lecturers, and each rising generation of teachers offers loyalty to this mother of educational associations, with her crown of three score years. It is a peripatetic body, going hither and yon over all New England, with an occasional journey into New York, and thus it has scattered its beneficent influences through every nook and corner of the New England States, whence with the migrations of the restless Yankee they have spread to the South, to the West, and even to the Pacific slope. Ever since the formation of the National Educational Association, with its splendid gatherings of thousands, the older body has lost nothing of the love of the teachers within the former area of its meetings The larger meetings of the larger association, perhaps, by a well-known arithmetic, divide less of profit to the individual listener than the more familiar gatherings of the American Institute, in which heart draws very close to heart, and the experience of the older teachers comes into most helpful contact with the enthusiasm of the younger. "The meetings of the Institute are the best of the year" is a very frequent comment among observing teachers.

The attendance at the meetings has varied within the last dozen years from 500 to 2,300, which can only by comparison be deemed small. There is usually a rivalry among places seeking the coming of the meeting, and many kind attentions are shown by the residents. Reductions in railroad fares and in hotel rates are freely made; thus the long journey and the stay of three or four days are brought within the means of teachers with limited salaries. At the meetings themselves, the mornings and evenings are devoted to the discussion of educational subjects, while the afternoons are left free for rest and recreation. Membership, which costs but a dollar a year, opens the way to all the reductions of rates and other privileges of the meeting.

It is impossible to state just now when and where the next meeting will occur, as those matters will be definitely determined at a directors' meeting in January; but custom in recent years practically fixes July 6th, 7th, 8th and 9th as the dates for the meeting of 1891. As to place, there is a sentiment in favor of some point in the White Mountains, and it is certain that it will be within easy reach of Montreal and Saratoga. Wherever it shall be, I can promise the presence of some of the ablest speakers in New England and, besides, I am not without hopes of drawing a few from your own preserves across the border.

Let me extend, through you, to the teachers and friends of education in the Atlantic Provinces and all Canada a hearty invitation to visit us next summer and enjoy to the full the pleasures of a meeting with the American Institute of Instruction. Cordially yours,

RAY GREENE HULING.

New Bedford, Mass., August 18, 1890.

FRENCH ACADIAN CONVENTION.

From the excellent reports in *L'Evangeline*, we are able to cull a few items of specially interesting educational import in the action of the great French Acadian Convention, held on the 13th, 14th and 15th of August at Church Point, Digby County, Nova Scotia. Over 2,500 were in attendance, representing the provinces of Canada specially; but having representatives also from Quebec and the United States.

Resolutions adopted by the Convention.

1. The Acadian Convention decrees that it is desirable that in all our schools, whether primary or secondary, academies or colleges, convents or boarding schools, the English language be taught concurrently with the French, but as far as possible the language of teaching should be French.

2. The Convention humbly desires to draw the attention of the authorities, both religious and lay, to the fact that there exists in Nova Scotia and Prince Edward Island a great number of localities altogether French, in which French is not taught in the educational institutions; that this state of affairs is very prejudicial to the best religious and material interests of the Acadians; that it is desirable to remedy this ill by encouraging the teaching of French to all the Acadians without prejudice to the teaching of English or any other languages.

3. The Convention regrets that in a great number of our convents, principally in the counties of Digby, Yarmouth and Richmond, the French language is either not taught or but imperfectly taught. This state of affairs is seen in the centres where the majority and even all the children and parents are French. We desire to respectfully attract the attention of competent authority to this regrettable deficiency.

4. The general committee invite the Acadians of the Maritime Provinces to keep, each year as a holiday, their national festival in each French settlement, and whereas, thanks to God, we become Catholics as we become French, the celebration of the holy sacrament of the mass should in all cases enter into the programme.

5. The next Acadian Convention will be held in Cape Breton, at the place and date chosen by the committee of oganization duly convened.

His grace, Archbishop O'Brien, was not present in person. We translate the closing portion of his letter to the Convention, referring to the language question.

"One word on the question of language. Is it true that our Acadians should study and cultivate the French language. However, we do not hesitate to say, that he who places an obstacle in the way of the learning of English cannot be considered a true friend of the Acadians. He who will not recognize the utility of the English language for the Acadian people can only be either a man wrapped in prejudices or one who cannot see beyond the hills of his own village. The affairs of this country are conducted in English, as are also those of the United States. And as a consequence a commercial English course is a first necessity for the young Acadian if he wishes to succeed in the commercial world.

Those who are convinced of this fact, and who are not afraid to avow it, in striving to inculcate their idea into the minds of those whom they should benefit, whether it is agreeable or not, are the true guides of the people and their true friends; and not those men of narrow mind and oblique view who appear to think that it is sufficient for the Acadians in order to become great and prosperous to know the French language.

As for you, gentlemen, you will raise yourselves above these infantile views, and will consider the realities of life. You will regard such notions as unworthy of the attention of serious men. You will act on this question as you would if one asked you to select the pattern or color of a piece of cloth."

NEWFOUNDLAND SCHOOLS.

The statistics of the Newfoundland schools for the year ending June 30, 1889, are before us in three pamphlets. The report of James J. Wickham, superintendent of Roman Catholic schools, contains 105 pages; of William Pilot, superintendent of the Church of England schools, 86 pages; and of George S. Milligan, superintendent of Methodist schools, 86 pages. They are extremely interesting from a Canadian point of view; but we cannot attempt at present more than giving a summary note or two from them:

	Schools.	Teachers.	Male.	Female.	Average No. registered each quart'r	Boys.	Girls.	Teachrs' salaries.
Roman Catholic	188	193	58	125	7073	4017	3056	21,149.66
Ch. of England	179	177	105	72	6857	3699	3158	29,811.52
Methodist	135	131	48	83	5762	3112	2650	20,803,40
Total	502	501	211	290	19692	10828	8864	$71,764.58

From this it can be readily seen that so far as salary is concerned our fellow workers in the ancient colony are not so well off as ourselves. This point is forcibly alluded in the reports. There is improvement however along the line. Arbor day has been duly observed, as with us.

Would it not be a capital idea for the teachers of Newfoundland to meet in convention once a year, and in order to receive the greatest benefit possible, should not all the three classes of school teachers meet together. If such an institution were modelled after that of Nova Scotia, in which the Superintendent of Education is ex-officio president, it might be modified in Newfoundland by a constitution making each of the three Superintendents President in turn, beginning with the senior in office, the other two being vice-presidents when not president. Superintendents make good presidents of teachers' conventions for more than one reason. They are in virtue of their position intermediate between the teachers and the government, and therefore give the most direct information from one body to the other whenever required. They will be interested in preventing any extreme measures taken which would react injuriously on the relations between teachers and the government, so that convention work is more likely to be guided judiciously under them, producing the minimum of irritation with a maximum effect.

As we hope the Educational Review may become the acknowledged organ of all the teachers of Newfoundland, we should be glad to have concise expression of views from them on this or other matters.

Mission of the Kindergarten.

No one can live in a large city without having thoughts severely exercised by the condition of the poor. What can be done to alleviate their condition? What especially can be done for the little child who is early sent out to beg or to earn a pittance—the street waif? During the last century there arose one who was able to offer a solution to this problem. His keen insight discovered the secret that the elevation of humanity is dependent on education. That this education must begin with the first dawnings of life. He devoted long years to the study of child-life, and finally came to the conclusion that the most important period in human education is before the child attains his seventh year. He realized the influence, on the whole of the after life, of the tone and bent given to these early years. Having himself experienced the weary longing of an unsatisfied, neglected childhood, he was not content to let the pain of this experience vanish without at least trying in some way a means to satisfy and develop the craving and instincts of child nature.

It was no easy task to which he devoted himself, but with this object in view, he was not content to pass through life, quietly, safely and creditably, as might have been consistent with mere reputation, but he sought to prove himself a good man and true; to acquit himself like a hero. The children of all future generations will rejoice that *Frœbel* ever lived.

In establishing the Kindergarten he provided a place where the little human plant may be cultured, where all the needs of child-nature can be supplied. With every healthy child the brain is busy, the body active, and if proper work is not given for both to do, it will seize upon whatever comes near. In the Gifts and Occupations of the Kindergarten, Frœbel provided for this phase of child-nature, giving it work it can do and enjoy. When it sees the result of its work in the structure of blocks it has erected, or in the mat it has woven, it learns by experience that labor and self-exertion alone give happiness. The social element in the child's nature is satisfied by meeting with children of its own age and attainments, and in the games and songs it finds an outlet for the exuberance of young life which will manifest itself in play.

While with the object lessons and the various devices for drawing out the child's powers of observation, these powers are quickened to such an extent, that the world ever after is richer and brighter.

We suffer, all of us, from the limitation of the insight which would open our blind souls to myriads of happy impressions. One of these forlorn, neglected little beings comes into the Kindergarten. He has been accustomed through the years of its baby-life to disorder and dirt, to the jarring sounds of harsh voices, to unkind words and rude acts. He has begun to feel somehow there is no place for him in the world, that he is always in the way in the poor room he calls his home. His overworked or dissipated parents think they have fulfilled their duty if they give him sufficient food to keep him from starving, and he is sent into the streets to find what employment these haunts afford for the busy little fingers and the growing brain.

The Kindergarten is to him a new world. Here he feels that interest is taken in him personally. He feels instinctively the elevating effect of order and cleanliness, he comes under the influence of that powerful agency, which perhaps he has never felt before, the influence of love. We have seen the lip quiver and the eye fill with tears, when instead of the harsh reproof and the sharp cuff to which he has been accustomed, a hand has been softly laid on the shoulder, and kind words have fallen on his ear. His rough exterior and ragged garments cannot conceal the fact that under it all there is what the highest and the lowest alike possess, the yearning, struggling, rejoicing, sorrowing, human heart.

In the Kindergarten his busy brain is supplied with food for thought, in the pretty stories and object lessons given by the teacher, his ear is pleased with the bright and cheery songs, and his hands are employed with work, which he soon learns to love and take an interest in.

In the plays of the kindergarten, while they please and delight, he is brought into such relations with other children that all the principles which govern society are brought into action.

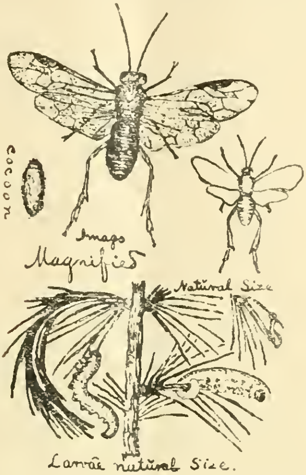
He learns to respect the rights of others, and to respect himself; and through it all, through the work and the play and the lessons, he feels the influence of the law, he learns that by following a principle he will surely come to a certain result, and that law, not accident, rules in everything.

So we hope by the daily work of the Kindergarten to counteract the evil influence and the disadvantage under which these city waifs have been born, and to give them at least a fair chance of developing into useful and respectable citizens.—*E. J. Jameson, New York.*

Manual work, whether in paper, in clay or in wood, if duly accompanied with measurement training to a sense of proportion and beauty, would become a most valuable educational instrument.—*Dr. J. G. Fitch.*

FERNDALE NOTES.

TEN YEARS FROM BOSTON TO HALIFAX.



The Larch Saw Fly (*Nematus Erichsonii*, Hartig.)

Walking through the Young memorial gate into the beautiful park of which Halifax has good reason to be proud, about the commencement of the holiday, we looked at the fine larch trees among the spruce and pines to see if the prediction made by the REVIEW last September and repeated this July was showing any sign of fulfilment; if the Larch Saw Fly first noticed near Boston in 1880, in the borders of Quebec in 1882, in New Brunswick in 1884, in Western Nova Scotia in 1888, would reach the heart of Nova Scotia in 1890, and leave behind it the brown spines of the tamarac as if they were licked with flame. But the Halifax tamarac was green. Among its still branches we noticed a fly, simply a house fly it appears in the distance, but one with strange tastes, for it flew lovingly in and out around the branches as if it had a special affection for the fragrant boughs. We bade a midsummer farewell to the park, and after a few weeks at the Summer Science School and its picturesque surroundings, again returned, to find the larches of Point Pleasant changed into scorched skeletons as lank as the spectres of the tamarac swamps of Maine which a few years before foreboded their destiny. Westward and northward have these small four winged flies flew some thirty and odd miles per year, until now the perimeter of their widespread devastation passes through Halifax and beyond Ottawa.

We figure roughly above the insect in its various stages. It belongs to the order Hymenoptera, and family *Tenthredinidæ* (the Saw-flies, so called on account of their saw-like apparatus for boring holes in the bark of twigs in which their eggs are placed). The fly may be described thus: Head and thorax as well as the nine-jointed antennæ black, together with the base and tip of the abdomen; segments two to five and part of the upper and whole of the lower surface of segment six of a rich waxy orange color; first and second pair of legs yellowish, the thighs a little darker and slightly tipped with black above, and the third pair of legs much longer than the others, with legs yellowish, but claws black, while in the fore legs the claws are yellow. The wings are black veined, with a tawny fore margin on the costa, The dark spot—the stigma—near the tip of the wing, black. The fly emerges from its cocoon about the first of July. The eggs are laid in the terminal young shoots of the larch (*Larix Americana*). Within a fortnight they are hatched. The larvæ eat the leaves rapidly, moulting four times, the first three times changing color and appearance very much. When mature it is about one and a quarter inches in length, blueish-white above with two double rows of black tubercles on middle segment, greenish beneath, head and thoracic feet black; prolegs, seven pairs, green. Before they pupate a brownish hue is assumed. They generally drop to the ground and spin an oval cocoon, brownish, about half an inch in length. The perfect pupa stage is not attained until next spring.

The larches do not always wither from the first attack; but recurring attacks are sure to kill them. No method of stopping the ravages of the pest has yet been discovered.

SISYPHUS.

A great many of our provincial papers are referring to the unusual destructiveness of the Colorado Beetle to the potato this season, and some want to know why the government is not taking means to exterminate the pest. Well, it is rather late to talk of extermination now, if we could not think of it before. When the Colorado Beetle coming along the isthmus, first folded its wings to alight on the territory of Cumberland County, in 1882, was the proper time to exterminate him in the Province of Nova Scotia. Nor were measures of a mild degree wanting. The Agricultural Society of Pictou at once published an illustrated circular fully describing the insect, and showing how to treat him. These were placarded all over the country. And the Provincial Society had a second edition of the same distributed and placarded in the west of the province. The result was that comparatively little injury was done for a number of years, until the area of careless people became so great that the beetle suddenly assumed dangerous proportions. A costly era of repression will follow, and the evil will diminish again, until some people or their neighbors will begin to imagine it not dangerous after all. Thus it appears we are condemned to fight against an evil until it nearly disappears, leaving only enough to germinate, then relaxing our efforts an instant too soon, it all comes back again to arouse us to fight for life.

When the Potato Beetle entered Nova Scotia some eight years or so ago, the Larch Saw-Fly started towards us from its New England home. The Larch Saw-Fly has just touched Halifax, and now we hear of the start of the Gypsy Moth from the same centre. We trust that the experience of the past will enable our southern neighbors to stop this migration at the start. And to stop it means to kill every Gypsy Moth or caterpillar in the sixty and odd square miles now inhabitated by them. To kill millions and millions but yet leave two or three, is to have to do the work over again. A single moth escaping to any other part of the continent without being detected is sufficient to undo the $50,000 effort now being made in the interests of the continent in Massachussets. In a future number we shall endeavour to give a cut with a description of this moth, so that in case any should migrate in our direction we may commence their extermination before they may begin ours. Are we doomed in every thing to toil like Sisyphus in his Tartarean abode—

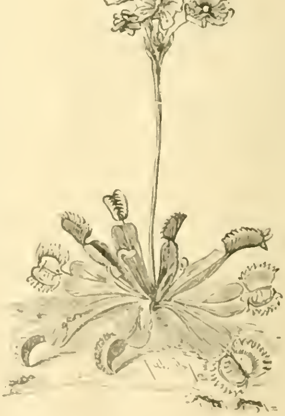
With heavy sighs and a heavy soul
  Up the long high hill to slowly roll
A huge round rock to the very top
  Where it rests for a moment then topples off,
And down again with a thundering sound
  Smokes in its flight along the ground.

A Startling Invasion.

The European Gypsy Moth, *Ocneria dispar*, appeared last year in a part of Massachussets, affecting an area of three miles by one. This year the area has extended to fifteen miles by four, or sixty square miles. As soon as it was recognized, an appropriation of $25,000 was made to exterminate it. The vote this summer has been increased to $50,000, and a cordon of men is drawn around the district, who examine even the carriages and merchandise moving out of the district for fear some cocoons might be secreted in them, and transported beyond the lines. The trees in the district are being sprayed with batteries of pumps discharging water poisoned with Paris green. But there are a good many hiding places in sixty square miles. How much easier it would have been to have killed the first one. If the United States forces are worsted in this engagement, the continent will suffer more from it than from the Colorado Beetle and Larch Saw-Fly combined. Its larva feeds on the leaves of the apple, cherry, elm, linden, maple, poplars, birch, oak, willow, spruce, and corn; and the insect is very prolific. Let the people see what the Saw-Fly from Massachussets (described in this issue), has been able to do to our fine larches, and imagine the same process applied to all the trees in the list just given. Every soul in Canada has a deep interest in this fight, whether he can realize with vividness the gravity of the interest involved or not.

Plant Study.

A Curious Insectivorous Plant.



In the July number of the Review, a description was given of a few of our insectivorous plants—the Sundews and Pitcher-plant. A few weeks ago we received through the kindness of Rev. Mr. McIntyre, Faison, North Carolina, a fine specimen of the most remarkable insectivorous plant in the world—the Venus' Fly-trap, (*Dionæa muscipula*) It belongs to the Sundew Family, and resembles our common Sundew (*Drosera rotundifolia*) in having a rosette of leaves close to the ground, from the centre of which a flower-scape, about a foot in height rises, bearing from eight to ten pretty white flowers. This fly-trap has no sticky solution, like the Drosera, with which to tempt the flies, but instead the upper part of the leaf is divided into two lobes, on each side of the mid-rib. On the inner or upper surface of each of these lobes are three sensitive hairs or filaments. If any of these hairs is touched by an insect, the two lobes fly together instantly and the strong bristles on the edge of the leaf interlock in the most curious fashion, imprisoning any but the strongest flies, that may have disturbed the sensitive filament. The imprisoned insect is soon enveloped in a sticky secretion, which exudes from the inner surface of the leaf, and important item that the line originated at its lower extremity. I fancy that the point of light as it flashed upward and defined the line, gave the two observers alluded to the impression of something larger than what was really to be seen. MYLTON MAURY.

New Glasgow, N. S.

For the REVIEW.]

Higher Musical Culture.

How vast the distance that separates the shepherd in Virgil's Eclogue, practising a sylvan lay on his oaten pipe, *sub tegmine fagi,* from the clever amateur! Yet a whole realm of unexplored thought and feeling lies between the mere amateur and the accomplished musician who has lived in a musical atmosphere and submitted himself, with intelligent docility, to the subtle play of its complex influences.

For the multitude music is still nothing more than a flowing successions of sweet sounds arranged in pleasing rythm. By actual observation, even among those accustomed to musical entertainments, it has been found that harmony is ignored and only the melody really followed. It has not been sufficiently recognized, that music, as an art, must rest on the solid basis of scientific knowledge and original investigation. No thoughtful person would deny this vital connection between science and plastic art, but many would not concede the same necessity for musical art. Why is this? Partly, perhaps, from the more spiritual nature of the latter; partly, also, because music is, in and of itself, so pleasing in its results that its votaries rest content with a smaller measure of excellence than would command respect in any other pursuit, the finished work of which could be easily submitted to comparative analysis. But perhaps the fact that music is generally regarded as nothing more than a pleasing accomplishment and an elegant adjunct to a fashionable education weighs most strongly in the popular estimation of its claims.

But the student who has made himself familiar with the history of musical art, and who has critically examined the works of the great masters who have enriched it, will sometimes find himself at a loss to determine which is the more admirable, their profound musical knowledge or their inspired genius. It is not too much to assert that Bach, Handel, Cherubini, C. M. Weber and Beethoven were enabled to attain heights which would have been inaccessible to them with all their genius, if that genius had not been nourished and fortified by a thorough knowledge of the science of their art so far as it was known in their day.

To enjoy the music of Wagner, even as a listener, requires at first unflagging attention and no inconsiderable musical knowledge. One who would make a fruitful study of his works needs a competent guide amid the intricacies which appear, to the tyro, mere arbitrary purposeless wanderings, but which analysis proves to be strict, though subtle examples of obedience to musical law. We have no desire to undervalue the labors of those who are faithfully working in the interests of musical art, but a far more serious and definite course of training and instruction will soon become necessary if we are to cultivate to their fullest extent the musical talent of these provinces, and to raise music from an accomplishment to the dignity of an art and a science.

No mere provincial training can give that comprehensive grasp that makes one not only a finished performer, but a discerning critic, a great artist, an original composer, and an able leader in the vanguard of musical progress. It may be said, Why not send the clever young musical aspirant abroad at once and expose him to the full influence of the musical atmosphere of England, France and Germany?

Many reasons might be adduced. Let two suffice. First, the change is so great from the simple life that obtains in this country to the complex social and artistic condition of a great musical centre, that the student is liable to be thrown off his balance, and in the destruction of mind that ensues, either fails to adapt himself to his new environment, or loses time and energy in doing so.

Secondly, the force of a great artistic community is so immense that it is apt to suppress or over ride individuality, especially in delicate organizations that lack the power of self-assertion.

It is just here that the value of a capable, music-loving teacher comes in; one able to give sound technical instruction and training, but of that impersonal character that encourages spontaneiy of expression in the pupil, thus bringing out traits peculiar to the individual, fostering originality and begetting a not improper sense of power and self-confidence. One year of careful systematic training, with the distinct aim to fit the pupils for entrance, upon examination, to some institution of world-wide renown in Europe, where they might pursue their studies under great specialists, with all the advantages of communion with distinguished artists in evrey department, would soon develop one of our natural resources—musical talent—and prove as profitable in opening up new avenues of usefulness to our young people as it would be honorable and pleasing to those who should succeed in bringing it about. C.

Echoes from the National Association.

The thirtieth meeting of the National Educational Association of the United States was held at St. Paul, Minn., July 8-11. The following extracts, selected from the N. Y. *School Journal* will enable our readers to catch the spirit of what was said:

FORM OF DISCIPLINE, ETC.

It is a question of teachers rather than of subject or method. Normal schools should point out that the power to teach lies in the individual and not in the method. No system however skilfully administered will prove successful. And in management it is the same; if there is need of corporal punishment it must be inflicted. Yet it must be remembered there has been an excess of this.—*Prof. B. L. Wiggins, Tennessee.*

WHAT EXAMINATIONS EFFECT.

While it is highly desirable that knowledge should be its own reward, it is very seldom it should be so; the desire for knowledge is an acquired taste. Daily markings by the teacher should be abolished: reviews should be held under the supervision of the principal or superintendent, and only the monthly estimates should be put in figures. The examination should be held only when a subject has been completed. Examinations exercise the reproduction of knowledge. They set up a standard for the pupil and they act as a stimulus for teacher and pupil.—*Supt. W. H. Maxwell, Brooklyn, N. Y.*

MORAL VALUE OF ART EDUCATION.

Few studies can claim to do as much as music and drawing toward advancing children in paths of peace, obedience and order, giving them present happiness, future occupation and a constantly elevated enjoyment. All children should be taught enough drawing to be able to express themselves readily with the pencil. Not with the purpose of making artists of them, but because such power is an enrichment of ordinary daily life. The higher our conception of material beauty, the higher will be our ideal of moral beauty.—*Ada M. Laughlin, St. Paul.*

THE WHITE CROSS IN EDUCATION.

My contention is that the true teacher's office is to explain the little child to himself, and afterward go as far as may be to explain the universe to him. Though a man's forehead be lifted toward the stars his feet are planted on earth, and a sound, pure mind must have a pure, sound body in which to dwell. The pupils' life should be lifted toward the heights, not lowered to the slums. What must be had in all large schools is a guardian of the playground; a moral horticulturist, whose specialty in physical ethics; an apostle of health whose gospel outranks that of head or hand, for without it the head is apt to swim, the hand to tremble, and the heart to be a cage of unclean birds. It would be better to abolish recess altogether and let gymnastic excercises under the teacher's supervision take its place. This seems one of the best practical means to a higher civilization in our public schools. Such is the opinion of experts in education.—*Frances Willard, Prest. W. C. T. U.*

COMPULSORY EDUCATION—TWO VIEWS.

Compulsory education is against the fundamental ideas of our public schools. Education is a right inherent in the family rather than a privilege delegated to the family by society. It is one of the highest duties of government to make ample provision for the education of the youth, but beyond this the state should not go. To enforce the attendance of children would invade the sacred domain of private life. The tyranny of a confident majority, as has been illustrated in religious persecutions in past ages, would arise. The American public school system has been built up without the aid of such laws, and the public school has become a vital institution of the whole people. The advancement of education is to be secured by making the schools better, equipping them better, providing more and better schoolhouses, and above all better teachers.—*Supt. Cooper, Texas.*

It is no more hateful, nor tyrannical, nor un-American to compel a citizen to educate his own child, than to compel him to pay a tax to educate his neighbor's child. To hold that compulsory school laws are un-American is to ignore the history of our free school system and remain ignorant of the spirit and purpose of past and present opposition to the establishment of free state schools.—*Supt. Thayer, Wisconsin.*

THE TRAINING OF THE EXECUTIVE POWERS.

The work of the teacher is to train the child, not merely to communicate knowledge to him. Man possesses receptive, reflective and executive powers. By the first class he acquires knowledge, by the second he prepares it for use, by the third he applies it. By executive power I do not mean administrative ability merely. I mean the power to execute what we know; the power to be in action all we are of good in feeling or thought; the power to accomplish what we plan; the power to "do noble deeds, not dream them all day long;" the power to mould humanity in harmony with God's great purposes. The world is filled with two classes of men — those who know the truth without even planning to practice it, and those who decide to do right, but fail to carry their plans into execution. Both classes are failing to accomplish the work they were intended to do, and both fail because their executive powers were not trained in harmony with their receptive and reflective powers. It should be the chief function of education to remedy this great defect in human character,—*James L. Hughes, Toronto, Ont.*

SYSTEM VS. ORIGINALITY.

The teacher's individuality should be such that it will not overshadow, but stimulate that of the child Too exclusive stress has been laid upon the literary qualification of the teacher. No amount of knowledge can compensate for the want of that individuality which enables the teacher to stamp upon the child the impress of his own character. The schools are filled with too many teachers whose only qualification is knowledge.—*Supt. Sabin, Iowa.*

THE KINDERGARTEN.

The kindergarten should never make the mistake of studying the tools more than the child. System is a good servant in this training, but a bad master, and a slavish observance of cut and dried details, would eventually kill the soulful creative faculty of the child. Nothing will succeed but a tireless study of the spiritual and mental needs of the little soul launched upon a sea of mystery.—*Anna E. Bryan, Louisville, Ky.*

Geology in Early Education.

The truths of geology and its facts and principles, if not too difficult of access, should command attention, in the earlier stages of education; and they are not difficult of access, and the study should receive its proper attention. Childhood being the period of observation, the acquisition of geological knowledge is therefore proper at that time.—*Prof. Winchell, Michigan.*

Music.

It has been demonstrated that the study of elementary vocal music can be placed in the regular course of schools, and its accomplishment acquired in the same way and on the same basis as is arithmetic and geography; the necessity for the music, both in concert and in individual recitation, being given with the same regularity as the spelling lesson. Music should be thus taught not as an accomplishment, but as part of that training that goes to make an intelligent citizen. The ability of the teacher to sing has little to do with the singing of the pupils, as they do the practising and not the teacher. Song singing is a small part of the legitimate work. Too often the children are not taught the difference between noise and song, and both principal and superintendent are blamed for the vitiated tastes of the children.—*Supt. Gove, Denver.*

Secondary Education

The high schools are prepared to do a great educational work in the community. But they have not reached a proper standard; in fact, they are some distance from it. This is yet only a provisional arrangement; it still purposes to do too much. The full benefit of the high school system will be obtained only when there is developed from it a series of special schools—all public schools, but each one a fitting school for something beyond.—*A. F. Bechdolt, Minn.*

The high school should fit for college and every influence should be exerted to get the pupils to go there; also the grade of the high school should be so high that it would be an honor to be graduated from it.—*C. W. Bardeen, Syracuse, N. Y.*

Too Much Machinery.

There is a growing feeling that the National Educational Association has reached a turning point in its history. Many well-informed persons believe that it can now profitably lay aside the excursion feature, allowing that interest to be cultivated by the various state associations, and devoting the general association to conventions of experts, who will give a trend to the educational thought of the country. The association threatens to fall apart by its own weight.—*Cor. School Journal.*

Pestalozzi never uttered a truer sentiment than when he said: "I would go so far as to lay it down as a rule that whenever children are inattentive, or apparently take no interest in a lesson, the teacher should always look first to himself for a reason."

Astronomical Notes.

The September Sky.

The Notes this month are for those who don't know, but wish to know, the most conspicuous of the celestial objects now visible in the evening.

Let us suppose "now" to be September 20th. The Review should have reached all of you by that time.

The Sun will set on that evening nearly due west. After he is gone the most conspicuous object will be the Moon, six days old, nearly half full, and a little west of south. When full at the end of the month, this will be the Harvest Moon.

Now look around and see if you can pick out any stars. There are three bright "evening stars" in sight, and if you look sharp you will be able to see at least two of them immediately after sunset—before sunset, indeed, if you happen to know where to look for them. An hour after sunset you will find the brightest one a little to the right of southwest and less than half as high as the moon. That is Venus. To the left of south and higher than the moon you will find another which you may perhaps think is as bright as Venus. That is Jupiter. The third of the "evening stars" is Mars, much less bright than Venus or Jupiter, red in color, and not very far to the left of the moon. On the evening of the 21st, when the moon is half full, she will be close above Mars, the following evening she will be off to the left of him. On the night of the 23rd she will be near Jupiter.

Mercury and Uranus are also "evening stars" at present, but they are much too faint and set too early to be seen. The next favorable opportunity for seeing Mercury will be in October, especially from the 10th to the 15th, when he will be a "morning star."

The above as to the Moon, Venus, Jupiter and Mars is true for the end of September *this year*, especially so (except when other dates are specified) for the hour mentioned on the evening of September 20th.

What follows is true in a general way for the end of September in *any year*, especially so for the hour or hours mentioned on the evening of September 20th. But if any of the above-mentioned objects should be mentioned again, then what is said in connection with them will not be true for every year.

Having tested your eyes in picking out the planets in the early twilight, you should try them next on the brightest stars. The brightest of all the stars—the Dogstar—does not rise to us at this time of the year until about a couple of hours after midnight; so it's no use looking for it. Canopus and Alpha

Centauri rank next, but they never rise to us — they are too far south. Next comes Arcturus, Capella and Vega, and they are above our horizon after sunset in September.

As soon as you can easily see Venus and Jupiter look almost directly overhead and try to get your eye on a star much like them in color. That is Vega. Now run your eye down towards the western point of the horizon. About two-thirds of the way down you should see a reddish spot doing quite a lot of twinkling. That is Arcturus. If the sky is clear low down to the east of north you will see another reddish one twinkling still more. Perhaps you won't be able to see it so early in the evening, but it will be conspicuous enough a little later. It is Capella. As the twilight wanes look again at Vega and run your eye from it to Jupiter. Nearly mid-way between them you will find Altair, one of the standard stars of the first magnitude. The others that have been mentioned are all brighter than first magnitude. Now turn to the Moon (Sept. 20th, 1890) and look a little to the right, and below her, about as far as Mars is to the left of her. The red star you see there is Antares. For information about it and the constellation it belongs to, see the REVIEW for May. Mars has been near it all summer. Venus is now moving towards it and will be very close to it on October 17th.

These are the brightest objects in our September sunset sky, and, if the sky is clear, they may all be seen quite early in the evening, while there is still light enough to read or write or play tennis by. If there are one or two others that you find it easier to see than some of these, it is not because the others are brighter, but because they are more favorably situated — higher up or farther from the sunset glow.

For these and the rest let us wait until later — say until 9 o'clock, your own local 9 o'clock. At that hour, mean time on September 20th, it will be within a few minutes of 21 o'clock sidereal time. If you have a celestial globe and know how to use it, you can adjust it so as to show the position of the constellations at that hour as seen from wherever you may happen to be. If your latitude is 45° N., raise the north pole of your globe 45° above the wooden horizon That is the adjustment for your *place*. For the *time* adjustment there are several ways of giving directions. It is an opinion of mine that the simplest way is to give them in terms of sidereal time. About March 20th, our p. m. hours of mean time are the same as the hours of sidereal time. A month later the sidereal time can be got from a p. m. hour by adding two hours, *two* months later by adding *twice* two hours, and so on. September 20th is six months later than March 20th, therefore 9 p. m. mean time on September 20th is 9 plus 6 times 2, that is, 21 o' (the sidereal) clock. This is not an exact statement of the relation between mean time and sidereal time, but it is quite exact enough for our present purpose.

Well, adjust your globe for *place* as above. Then find XXI. on the equator and bring it to the brass meridian. There, now, the upper half of your globe shows the constellations that are above your horizon at 9 p. m. on September 20th. And it shows them and their stars not only in their proper positions relative to each other — as a star-map does — but also in their proper positions with respect to your zenith and to your horizon, and to the north, south, east, west and other points of your horizon — which a star-map cannot do. A celestial globe is thus a very useful article for a star-gazer. And yet for a beginner at the business it is apt to be rather more puzzling than useful. If you wish to know why, get a globe and try. But a star-atlas is much cheaper and much easier for the novice to work with.

At 9 you will find that Venus has set — so has Antares. Mars will follow soon after. Jupiter has moved westerly and is now a little to the right of south. Vega and Altair have also gone west a bit. Arcturus is close down to the horizon. Capella has got higher up and farther round to the east. Why all this is thus is a matter that is *ultra vires* of this article.

To the west of north you will see the Dipper, upside up just now. Before Arcturus sets, notice that he is nearly in line with the two outer stars in the handle of the Dipper. This will help you to recognize him any time when he is in sight. Now, take the two stars in the bowl which are farthest from the handle run a line from the one in the bottom of the utensil to the one in the top. Produce this line about six times its length and you will come to the Pole-star, a standard star of the second magnitude. The Pole-star is at the outer end of the handle of the Little Dipper. It is not so easy to distinguish this Dipper as the other one, but it is easy enough after a little looking. The three stars in the handle and the two at the top of the bowl curve round from the Pole-star towards the handle of the big Dipper. The two in the handle that are nearest the bowl and the two in the bowl that are nearest the handle are quite faint; the other two in the bowl are much brighter. Mid-way between this last pair and the star in the middle of the handle of the big Dipper there is a star which is famous as having been the pole-star at the time when the Pyramids were built. Its name is Alpha Draconis.

Now face towards Arcturus again and run your eye up from it toward Vega. When about a third of the way up you will find half-a-dozen or more stars (one much brighter than the rest) arranged in a curve something like an arc of a circle. Between this diamond necklace and Vega there are four stars forming a quadrilateral figure, almost a trapezium. The necklace is Corona Borealis, the Northern Crown; the trapezium is part of Hercules. The stars between these two groups and the part of the horizon lying between west and southwest belong to the constellations Hercules, Ophiucus and Serpens. They are shown on the map that appeared in the REVIEW of November, 1889. Along with that map there was an article on Lyra, the constellation to which Vega belongs. You might find the map and the article of some interest now.

Higher up than Vega and right overhead you will see the Cross formed by the principal stars in Cygnus the Swan. At our supposed hour the top of the Cross is almost exactly in the zenith, and the upright beam of it stretches down towards the southwest. If you run a line upwards through the three stars in the cross-piece you will come to a small quadrilateral figure which is in the head of Draco, the Dragon. A fifth star still farther from Cygnus makes a curved V with the four in the quadrilateral. One of these four is the pretty double Nu Draconis, for which see the Lyra article of November last. Your glass will tell you which one it is.

Face round south again and look up at Altair, which you found in the twilight between Vega and Jupiter. Look at the stars above and below it — the one above brighter and nearer than the one below. The three are easily remembered. They are the brightest stars of Aquila, the Eagle. Above and to the left of them look for four small stars arranged in the form of a diamond. Some call the group Job's Coffin, others call it the Ace of Diamonds. It forms part of the small constellation Delphinus, the Dolphin.

Above Jupiter you will see two stars one above the other. They are Alpha and Beta of Capricornus — Alpha the upper one. Your eye will see that Alpha is double and your glass will show that Beta is so too. Those stars to the right of Jupiter and near the horizon belong to Sagittarius. Six of them form the Milk-Dipper. It is upside down; its handle, which contains only two stars, stretches across the Milky Way.

That will do for the western half of the heavens at this hour. Now turn to the east. Here there are no planets at present — none at any rate visible to the naked eye. And, therefore, whatever is said about the objects now there will hold good in this latitude for 21 o'clock sidereal time on any day of any year. What is said as to the positions of the stars with respect to each other will hold good for any hour of any day of any year.

Between south and east, and down near the horizon, two stars stand out much brighter than any others in that quarter. The brighter of the two is the one on the right. Its name is Fomalhaut (pronounced fomalo.) It is nearly of the first magnitude, and is the farthest south of the baker's dozen of brightest stars that we ever see. The other is Beta Ceti, the brightest star in the Whale. Higher up, half way or more to the zenith, you will find two stars nearly in line with Beta, and two others almost exactly in line with Fomalhaut. These two pairs together form a large diamond or square. It is the Square of Pegasus, sometimes also called the Handkerchief. The star at the left hand corner is one of three in the heavens which enjoy the distinction of belonging to two constellations. It is both Delta Pegasi and Alpha Andromedæ. Pegasus lies round to the right of it just now. Andromeda stretches down to the left towards Capella, that brightest star in the northeast. Andromeda is easily distinguished by three stars in line, but not equi-distant, lying to the left of the left corner of the Handkerchief. Above the middle one of the three you will see two smaller ones. Near the upper of these two lies the famous Andromeda Nebula, the only object of the kind that can be easily seen by the naked eye.

Between Andromeda and Capella there is a row of stars forming a J. That makes the constellation Perseus. Its most remarkable star is Algol the famous variable. It is the brightest star in the space between Andromeda and the J, and lies below a line forming the brightest star in J with the left hand one of the three just mentioned in Andromeda. If you watch Algol at hour intervals on the evening of October 5th or October 8th you may chance to see what is meant by calling it a variable.

Between Andromeda and the Pole star look for five stars that make a sort of W — one half of the W being smaller than the other. A sixth one, less bright, added to the five will make a chair in either of two ways. The constellation is Cassiopeia.

Between east and northeast you may see the Pleiads. For them see the REVIEW for January last.

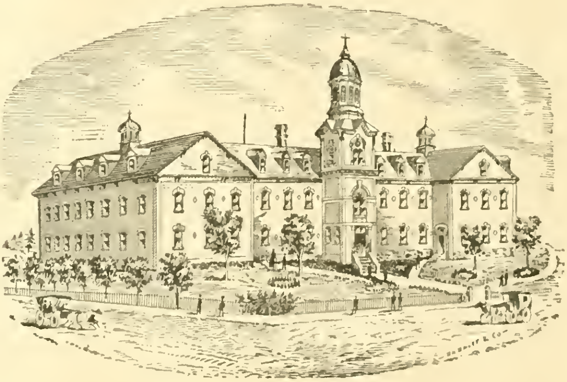
A. CAMERON.

Yarmouth, N. S.

Should headmasters and headmistresses be teachers? At first thought many, who know something of all that is involved in the management of a large school, will be ready to say that the responsible heads have enough to do without teaching, and that their whole time is needed for oversight.

St. F. X. College, Antigonish, N. S.

The governors of this college erected a new building two years ago, a cut of which is shown here. It is built of brick, and consists of a main central part, and two wings. The central part is ninety feet long by forty, and has a tower ninety feet high projecting eighteen feet in front. The wings are each eighty feet long by thirty-eight. The building faces north, and at the south end of the western wing is a brick kitchen twenty-seven by twenty-two. The interior of the building is divided with a view to the twofold purpose of class work and residence of both professors and students. There are always several students who board in the town, but the majority reside in the college. On the first floor are three class rooms, the laboratory, the chapel, the dining room (thirty-six feet square), the President's room and office, two parlors, and a recreation room for the junior students. The main entrance is through the tower into a hall fifteen feet wide, where the main staircase leads to the second floor. Here a hall nine feet wide runs from end to end of the central building. On the south side of it are the Professor's private rooms The other divisions on this floor are two study rooms, one class room, the library, the infirmary, two bath rooms, a recreation room for senior students, and the college hall with its ante-room. This hall is sixty feet by thirty-six. The third floor is entirely used for student's sleeping apartments. In winter the whole building is heated by about two miles of hot water pipe, the water being heated by three Gurney furnaces. A successful attempt was made in this building to secure ventilation for some of the most important rooms. Two of the flues were made large enough to have in each two outlets, one for smoke and the other for vitiated air. The thin portion between the two parts of the flue—in fact the whole flue—is warmed by the furnace fire, causing an upward current in both parts, so that the openings into the part in which there is no smoke give good outlets for bad air. These openings are near the floors. In another part of the building a galvanized iron pipe, one foot in diameter, serves the same purpose. In this the upward current is caused by a hot water radiator encased at the bottom of the pipe. To have good ventilation, however, it is not enough to provide outlets. Pure air must be brought in. In warm weather this is easily done through open windows but in winter the best way is to warm the air brought from outside before it reaches the room. In this building hot water coils are made to serve the purpose. In the basement two large coils (six hundred feet of pipe) are encased in two galvanized iron boxes. To these the cold air is conducted through a pipe connected with an opening in the wall of the building. This aperture is twelve feet from the ground. From the boxes pipes conduct the warm air to the rooms. Care was taken to have the boxes and pipes as nearly air-tight as possible.



What St. F. X. College is perhaps most noted for is its classical course. Four of its present Professors studied several years in Rome, in whose colleges Latin may be almost said to be a living language.

For the REVIEW].

Normal School Education.

A good deal of quiet but persistent attention has of late been given to the method of licensing teachers which has been practised in Nova Scotia for twenty years or more. The conviction has taken definite shape in the minds of the leaders of educational thought among us, that we have long since out-grown the provision which it was necessary to adopt when our system of education was in its infancy. It is well known that no professional training has ever been required of candidates for license. Attendance at the normal school has been entirely voluntary, and indeed students have been attracted thither not so much, in the majority of cases, by the professional, as by the non-professional advantages the school is supposed to afford. It will readily be seen that to no small extent, the two interests which the normal school undertakes to serve, are somewhat conflicting. In so far as it endeavors to discharge completely its functions as an academy or high school, its character as a professional school must suffer. Hence it is, that not only have comparatively few persons who enter the teaching profession any special training for their work whatever, but even those who prepare for their license examination at the normal school are very imperfectly trained professionally.

The time has admittedly come when no one should be allowed to teach in the schools of Nova Scotia who has not had a more or less complete course of special training for the work, and when the non-professional or academic preparation of candidates for licenses should devolve upon the academies and other schools, leaving to the normal school the exclusive function of training in a professional way, those who shall have already satisfied the non-professional requirements of their respective grade.

To effect these changes it will not be necessary to make any radical changes in the machinery or the method of examination, or in the syllabus of non-professional subjects agreeably to which the examinations are at present conducted. It is quite true that some such changes are in themselves desirable, particularly is it desirable to materially elevate the standard of scholarship for grades C and D, and it might be fitting to make such changes concomitantly with the reform in contemplation, but it must be remembered that the one set of changes is in no way conditioned on the other.

Thus the provincial examination could be held as now at the various stations. The syllabus (exclusive of professional subjects) could either remain as it now stands, or be modified as may be intrinsically desirable. Successful candidates would then be accredited, in respect of their scholarship, simply as *first, second, or third* class. In order thereafter to become fully qualified to teach under these grades of license respectively, it would be further necessary for candidates to submit themselves to the course of professional training prescribed for the grade aspired to. This training would of course be provided for by the normal school. The course prescribed for grade B might well cover the full normal school year, from November till July, though for the present that demanded of Grade C candidates might extend only from the opening of the session till the end of April. These two courses would have much in common, the former, though more extended and more philosophical, involving as well the more exclusively practical character of the latter. Would it be necessary then that the one who had taken the more elementary course as a C candidate, should afterward be compelled to take the higher as a candidate for Grade B? It is here suggested in reply, that a Grade C teacher of say one year's successful experience, who had previously taken the six months course of training at the Normal School, might be admitted to the rank of Grade B after reaching the necessary scholarship standard, and after undergoing examination upon a prescribed course of professional reading, without an additional term at the Normal School. In other words there might be two methods by which one could qualify professionally for a Grade B license, either by taking the six months course at the Normal School, teaching a year under C license, and undergoing an examination on a course of advanced professional reading; or by taking the full nine months B course at the normal school.

It is quite aside from the purpose of this article to describe in detail the character of the training and instruction that should under these circumstances be given at the normal school, and yet in this regard it may be said, that among the prominent features of both courses, would be included provision for fuller instruction in vocal music, elocution, and natural science, than could be afforded to candidates in other schools. This instruction would, however, be especially adapted to fit them for their prospective work as teachers.

No allusion has therefore been made to the training to be demanded of candidates for Grades A and D. Probably it would be sufficient to make essentially the same requirements of the former as of the candidates for Grade B, with perhaps an examination upon a more extended course of professional reading.

It would seem desirable in reference to the professional training of Grade D candidates, that the course should not extend over more than six or eight weeks, and should be simply a drill in the simplest matters of school keeping and teaching. Such a course the normal school could provide during the months of May and June, after the graduation and discharge of its six months' class. This course should in no way however obviate the necessity of taking the full course required of candidates for the higher grades.

From the above suggestions it will be seen that no revolutionary changes in the mode of administering education are involved in the proposal to make a certain degree of professional training incumbent upon all candidates for any grade of license.

The question whether provision might not be made, and of what sort, for granting professional certificates to those who should be able to give satisfactory evidence of good training elsewhere than at the Provincial normal school need not here be considered. Such cases would be entirely exceptional no doubt, and such provision need not in any case interfere with the general scheme.

FRANK H. EATON.

Kentville, Sept. 2nd, 1890.

Nova Scotia Summer School of Science.

The sessions of the Nova Scotia Summer School of Science, closing on August 2 at Parrsboro, have been the most successful in the history of the institution. Although the attendance was not quite as large as last year, it was much more representative of the country and of the teaching profession. The teaching was better, and the work more definite and better organized. The weather was very favorable, and all the excursions most enjoyable. Many of those present were heard to express their determination to be present next year, bringing their friends with them. The Nova Scotia teachers were much delighted with their associates from New Brunswick. These as teachers and pupils took high rank. Chemistry, as taught by Prof. Brittain, of Fredericton Normal School, was one of the most attractive features of the Summer School, while in the higher departments of Botany, Principal Hay was equally appreciated.

The students in attendance were:

H. L. Flowers, Halifax; E. M. Flowers, do.; M. R. McCurdy, do.; A. M. Johnson, do.; B. J. Trenholm, Amherst; M. Shine, Halifax; F. G. Berton, St. John; Ellie Sullivan, Halifax; L. A. McKenna, do.; M. Sullivan, do.; B. Mahon, New Glasgow; A. J. Davison, Economy; L. Thompson, New Glasgow; Anna McKay, do.; E. Fletcher, Five Islands; H. S. F. Theakston, Halifax; G. Creighton. do.; M. Cavanagh, New Glasgow; G. Wagner, Pictou; L. A. Kirkpatrick, Parrsboro; M. E. Charman, Wallace; G. J. Oulton, Dorchester; F. J. A. McKittrick, Kentville; H. S. Freeman, Amherst; W. R. Foote, Kings; N. D. McTavish, Pictou; A. McLellan, Noel; H. M. McKay, Pictou; D. F. Campbell, Port Hawkesbury; M. Moody, Truro; L. Lynch, Aylesford; M. Fitch, Auburn; N. Peppard, Great Village; G. Murphy, St. John; L. S. Read, St. John; A. C. McSweeney, Moncton; F. L. Dieuiade, St. John; C. A. McCart, Acadia Mines; E. Wotton, Parrsboro; L. Wotton, do.; T. C. McKay, Halifax; O. Leake, Parrsboro; H. Sproul, River Phillip; A. Wadman, Five Islands; A. Wier, Sand River; B. C. Foster, Fredericton; G. A. Inch, do.; H. L. Galt, Moncton; I. R. Everett, Fredericton; P. Vanwart, St. John; J. Purdy, do.; E. H. Stewart, Pictou; A. E. Miller, Restigouche; A. McCabe, Parrsboro; S. A. Hirtle, Lunenburg; C. M. Crowe, Selma; L. B. Crowe, do., H. W. McKenna, Amherst; R. R. Duncan, Grand Pré; Mrs. R. R. Duncan, do; E. Thompson, St. John; Carlotta Maury, Boston.

NAMES OF TEACHERS.

Zoology. Principal A. H. MacKay.
Botany. Principal G. U. Hay, Inspector Lay and Principal I. M. Creighton.
Mineralogy. A. J. Pineo, M. A., and Miss M. T. Dwyer.
Physics. Principal E. MacKay.
Chemistry. Professor Brittain.
Physiology. Dr. M. L. Angwin.
Geology. Rev. Dr. Maury.
Astronomy Principal Cameron, Yarmouth.
Music. Miss A. F. Ryan.
Elocution. Miss H. E. Wallace.

The school will probably meet next summer in Antigonish so as to suit the teachers of Cape Breton, Prince Edward Island and Eastern New Brunswick.

The officers and teachers for 1891, so far as selected, are:

President. Supervisor McKay, Halifax.
Vice-Presidents. Principal Hay, St. John; Inspector Roscoe, Wolfville.
Secretary. ——— ———.
Assistant Secretary. L. A. McKenna, Halifax.
Microscopy and Histology. Principal MacKay, Halifax.
Botany. Principal Hay, Inspector Lay, Principal Creighton.
Geology. Dr, Kennedy, Kings College.
Mineralogy. A. J. Pineo, M. A., Pictou.
Zoology Professor Brittain, Fredericton.
Chemistry. Professor Coldwell, Wolfville.
Astronomy. Principal Cameron, Yarmouth.
Physiology. Dr. Angwin, Halifax.
Physics. Principal E. MacKay, New Glasgow.
Music. Miss A. F. Ryan, Halifax.
Elocution. Miss McGarry, Halifax Ladies' College.
Pedagogy. Professor Eaton and Dr. Hall.

Lectures on pedagogy free to all enrolled students.

Principal Calkin of the Normal School, Truro is taking a tour through a portion of the United States, with a special view to matters educational.

Educational Meetings.

The Teachers' Association of the District of Kings and Hants, Nova Scotia, met in Kentville Academy, July 11th, with about fifty teachers present. The President, Inspector Roscoe, gave the opening address. Papers were read by Mr. E. B. Newcombe "School Houses and Grounds;" Principal A. M. McLeod on "Health;" Principal Smith, of Windsor Academy, on "Physical Training;" Principal Reid, of Wolfville, on "Teachers' Salaries." This was followed by a brief discussion on a Teachers' Union and cognate matters, in which Principal Calkin, of the Normal School, Principals Reid, Miller, McLeod, A. McN. Patterson, Shaw, W. F. Cogswell and Mr. F. J. A. McKittrick took part.

On motion a committee of five, namely, Messrs. McLeod, Miller, Shaw, Miss Burgoyne and Mr. Smith were appointed a committee to draft a memorial to the Government in this connection. In the evening a public meeting was held and largely attended by the citizens. The speakers were Principal Calkin, W. E. Roscoe, barrister, who read an able article on School Punishments, from an historical and legal point of view, which we shall put before the readers of the REVIEW at some future day; Professor Kierstead, of Acadia College, Dr. Allison, Superintendent Education, A. McN. Patterson and Rev. W. P. Begg. On the second day, Miss West, of the Kentville Academy, gave an exhibition of good teaching. Mr. W. T. Gratz read a paper on Arithmetic; Mr. W. S. Shaw on the "Nature Lessons" of the course of study, in which he gave important and sound advice, advocating the lessening of time given to the memorizing of geography, history and kindred subjects in favor of objective science teaching; and Mr. G. W. Coffins on the "Trials and Triumphs of Teachers." In the afternoon a paper on "School and Discipline," by Miss Chute, of Berwick, was read by Mr. B. W. Wallace. Mr. Bishop was elected Secretary and Treasurer of the Association. Closing addresses were delivered by Dr. Allison, Superintendent of Education, Mayor Chipman, of Kentville, and the President, Inspector Roscoe; and the Association adjourned to meet in Hantsport.

Any of our readers who purpose investing in a life or endowment policy will do well to peruse the card of the Ontario Mutual Life Company, published in another column. The General Agent, Mr. E. M. Sipprell, is quite able to explain the merits of his Company which on account of its safety, liberal policy and profit returns is without doubt, one of the best, if not the very best Company doing business in the Dominion.—*Advt.*

N S. Educational Association.

This Association meets in Halifax on Monday evening, December 29th, and will probably adjourn at noon Wednesday 31st—the day before New Year's Day. The programme is not yet complete; but it is expected to be unusually interesting on account of several circumstances. Our readers will find more detailed information in our subsequent issues.

The Summer School of Science of Atlantic Canada will next year be held at Antigonish or in Cape Breton. As soon as the Executive Committee makes its decision we shall have much pleasure in reporting the same. The eastern *Ultima Thule* of the continent is notably one of the most interesting to the tourist as well as to the scientist.

Educational Opinion.

While the colleges of the Maritime Provinces are training a larger number of students, they appear to be in a position to do it better. This indicates great progress in higher education. It remains for some person, or college, or government to come to the front with a project for providing scientific training in agriculture, engineering, the mechanical arts and handicraft.—*St. John Sun.*

From Mr. A. W. Edson's address before a section of the Massachusetts Teachers' Association: "The primary school should furnish an easy and natural transition from the free and unrestricted life at home or the kindergarten to the more arduous life and work of the intermediate and grammar schools. When the true spirit of the kindergarten imbues the heart of every primary teacher then will school life be made pleasurable to every pupil. Into the heart and life of a child there cannot enter too much sunshine. Before school days a child's greatest delight is in acquiring knowledge; the same pleasure in learning may be continued through all school life. All actions should be spontaneous, and should spring from a right motive. In the æsthetic training of children much may be done to lead them to recognize and love the beautiful in nature, art, literature and action. Too often we are reminded of eyes that see not and ears that hear not."

Rev. Edward Thring had a theory upon which he worked. His main principle was simple enough — that every boy is good for something, and that education means to help him to find out what he is good for, and to make the very best of him without making the capacity of one boy the standard of another. The principle sounds almost too obvious for statement. And yet to put into consistent practice, would be to sweep away the very last relic of cram, to change test by examination out of all recognition and to transform a public school from a place of polishing exceptionally clever boys into one for making the best of every boy individually, whatever might be the quantity or quality of his brains.

Professor Simon Newcomb, chief astronomer of the observatory at Washington, who, by the way, is a Nova Scotian by birth, doesn't like to be drawn away from scientific research by social dissipation, and on the occasions when he is thus drawn away he is apt to express his dissatisfaction with refreshing frankness. Thus the Detroit *Free Press* relates that toward the close of a reception at his house a lady approached the host and asked him with much enthusiasm: "How often do you have these delightful reunions, professor"? No polite prevarication delayed the reply: "Thank God, madam, but once a year."

SCHOOL AND COLLEGE.

The Board of School Commissioners at the regular monthly meeting held in the first week of September, have reduced the tuition fee of the Halifax County Academy to the rate of one dollar per month — six dollars per term of six months — for all students coming from *beyond* the county; while it is free to all within the city and county who are qualified to enter.

Acadia College has just decided to recommence the teaching of theology, and a new professor is to be appointed.

The Munro Exhibitions and Bursaries of the University of the Dalhousie College are attracting a greater number of competitors this year than before.

The Curriculum of the Halifax County Academy is being specially adapted to the requirements of candidate teachers up to grade A, and for candidates for provincial university matriculation. The attendance is the largest in the history of the institution, and numbers many students from beyond the county.

PERSONAL.

David Allison, LL.D., Superintendent of Education for Nova Scotia, will be in England September and October.

The eighth session of the *Congres International Des Americanistes* meets in Paris, 14th October. The delegates elected from the Atlantic Provinces of Canada are G. F. Matthew of New Brunswick, and A. H. MacKay of Nova Scotia.

Henry T. Colpitts, Esq., A. B., teacher of the Superior School at Elgin Corner, Albert Co., has been appointed Principal of the Grammar School, Richibucto. His successor is Mr. Herbert B. Steeves.

The Petitcodiac Superior School opened on Monday 11th August, with three new teachers. Mr. Hanson, A.B., is Principal, Miss Annie Sprague teaches the Intermediate department, and Miss Nettie Naughton the Primary.

F. W. Cowperthwaite, B. A., of the University of New Brunswick, has been appointed assistant to the Principal, Central School at Vancouver. Mr. Cowperthwaite was formerly head master of the Bathurst Grammar School.

Rev. Arthur Wentworth Eaton, a Nova Scotian, stationed in New York, who has attained some fame in the field of literature, has been offered an Episcopal church in Florence, Italy.

Miss K. Mackintosh, organist of the Brunswick St. Methodist church, Halifax, has published five hymns which have received the most favorable criticisms from high musical authorities, and have been adopted in choirs in Halifax and elsewhere. Several of this lady's compositions have taken prizes in London, the judges being among England's most eminent musicians.—*Exchange.*

Miss Mackintosh is one of the staff of the Halifax County Academy. The Halifax papers have been highly praising her latest composition, a *Te Deum Laudamus* composed for the occasion of the first public exhibition of the powers of the great organ just introduced into the Brunswick Street Church.

Professor Eaton of the Nova Scotia Normal School, who has lately been offered a professorship in Acadia, has declined. He has gone to Germany for a year.

Dr. Hall of the Nova Scotia Normal School, who has been in Germany during the past year, has returned.

Professor Howard Murray of the Halifax Academy, and Principal W. R. Campbell of the Truro Academy, have our heartiest congratulations on their auspicious movement into the benedictine ranks since our last issue.

Messrs. Hay and Brittain at the Summer School of Science discovered another habitat of *Aspidium fragrans* at the Moose River Falls in the Cobequids; a few days later the Misses Flowers of Halifax, Miss Jenks of Parrsboro, and Mr. A. H. MacKay, discovered at the Minnehaha Falls, near Parrsboro, *Aspidium fragrans*, *Asplenium trichomanes*, and *Aspidium aculeatum*, var. *Braunii*, all very important finds from the point of botanical distribution.

Dr. T. H. Rand, who has been spending a year in England and Germany, has returned to McMaster University.

Rev. Dr. Goodspeed has retired from the editorial management of the *Visitor and Messenger*, and has accepted the chair of Apologetics in McMaster University.

Dr. Ryan, of the Montreal High School, spent his vacation in Nova Scotia, visiting St. John the last week in August on his way home.

Geo. H. Croscup, Esq., formerly of the model school, Fredericton, but who has been residing in New Jersey for the past six years, visited the Provinces in August with his family.

Rev. Dr. McLeod of Fredericton, having resigned his pastorate, will give his attention more entirely to the *Religious Intelligencer*, which he has so ably edited for many years.

QUESTION DEPARTMENT.

1. What zoological atlas was used at the Summer School of Science?

(1). *The Biological Atlas*, by McAlpine, royal quarto (eight and one half inches by ten and one half inches.) Twenty-four colored plates (eight on plant life, nine on invertebrates, and seven on vertebrates. Price 7s. 6d. (2). *The Zoological Atlas, Part I.—Vertebrata*, by McAlpine, Imperial quarto (fourteen and one-half inches by ten and one half inches), twenty-four full colored plates. Price 10s. 6d. And *Part II.—Invertebrata*, Imperial quarto, sixteen full colored plates. Price 7s, 6d. All published by W. & A. K. Johnston, Edinburgh and London.

2. What is the best book for a beginner in entomology—the one mentioned as such at the Nova Scotia Summer School of Science?

Entomology for Beginners, for the use of young folks, fruit growers, farmers and gardeners, by Packard, cloth, about seven inches by five, pages xvi. and 367. Price not quoted, perhaps $1.50. Published by Henry Holt & Company, New York.

Literary and Scientific Announcements.

Ginn & Co., Boston, announce a second volume of "Open Sesame", a collection of prose and verse, to be ready in September.

The New England Magazine, Boston, is publishing a series of articles on Educational Leaders and Institutions. Horace Mann was the subject for August.

D. C. Heath & Co., Boston, will publish a Brief Course in in the Elements of Chemistry, by Jas. H. Shepard, Professor of Chemistry, and Chemist to the United States Experiment Station.

A Special School Issue of *Architecture and Building*, published by W. T. Comstock, 23 Warren Street, N. Y., will be brought out on the first Saturday of October. It will be sold at fifty cents, and will contain designs and descriptions of school houses from the smallest district school house, costing $500, to the largest and most elaborately planned academies.

Ginn & Co., Boston, will publish early in autumn, a Synopsis of English and American Literature", to contain in small compass the most important facts of English and American writers, from the Celtic Bards to the present time. The same firm also announces the publication in August or September, of Shelley's "Defence of Poetry", by Professor Cook of Yale College.

D. C. Heath & Co., Boston, will issue shortly Anatole France's "Abeille," De Vigny's "Laurette, ou Le Cachet Rouge." Selections for German Composition," with notes and vocabulary, and a new number in the series of *Guides for Science Teaching*, entitled *Insecta*, written by Prof. Hyatt, Curator of the Natural History Society.

Ginn & Co., Boston, will publish in September, Selections in English prose from Elizabeth to Victoria; also Allen & Greenough's Ovid, revised addition.

BOOK REVIEWS.

Shakespeare's Merchant of Venice; Julius Cæsar; with introduction and notes, by K. Deighton. London: MacMillan & Co ; and New York. These two volumes are the latest in the Shakespeare series published by MacMillan & Co. In addition to their excellent mechanical appearance and finish, the student will find the notes very full and valuable, with numerous references to Abbot's Shakespearian Grammar.

The Leading Facts of American History, by D H. Montgomery, with numerous illustrations, maps and tables. Mailing price, $1 10. Reference Hand book, for students of English History, by E. H. Gurney. Mailing price, 85 cents. Publishers: Ginn & Co., Boston. The first of these books aims to present the leading facts of American history, from its discovery up to the present year, in a clear, connected and forcible manner. Although this is done within the compass of about 400 pages, no important fact appears to be sacrificed. The style is admirable, and students who have read many books on American history will read this with all the avidity of a beginner, so fresh and sparkling with interest is the narrative. The second book named above should be in every student's library. It gives the descent of the kings and nobility of England.

Prize Essay of American Public Health Association.—We have before called the attention of our readers to the essays of the American public health association. They have been written by authors of well-known ability, with the special design of helping persons of moderate or small means in the management of their households. The last essay has been received—Practical sanitary and economic cooking, adapted to persons of moderate and small means, by Mrs. Mary Hinman Abel. To this essay was awarded the first prize among seventy competitors, and the unanimous opinion of the judges proves that it is a work of great practical value, and that it would in many cases assist in securing to families health, comfort, and happiness in life, if it could be placed in their hands. The essays are sold at a merely nominal price. Three copies of the above named essay, bound in cloth, may be obtained for $1, on application to Essay Department, American Public Health Association, Rochester, N. Y.

Elementary Algebra, by Charles Smith, M. A., Master of Sidney Sussex College, Cambridge. Second edition, revised and enlarged. Cloth, 7 in. by 4½ in , pp. viii. + 403. MacMillan & Co.: London and New York.

School Algebra, by G. A. Wentworth, Professor of mathematics in Phillips' Exeter Academy. Cloth, leather back, 7½ in. by 5 in., pp. iv + 362. It is not easy to decide which of these, taken all in all, is the better book. The price would probably decide the matter. They cover much the same ground. Wentworth has the largest type and simplest looking exercises. Smith appears to be fuller of matter of a more athletic kind Both are certainly among the best, if not the best text books on the subject for our ordinary high school course

A Compendious French Grammar, by A. Hjalmar Edgreen, Professor of modern languages and Sanscrit in the State University of Nebraska Cloth, leather back, 7 in. by 5 in., pp. xiv., lxvi + 293. D C. Heath & Co., Boston, U. S. A., 1890. This book first makes a survey of French grammar, in sixty-six pages. In the second part, two hundred and ninety-three pages, it takes up the whole minutely and in the most regular order, beginning every section with an historical account of the historical development of the forms of the part of speech under consideration. It makes French a philological study for the student who knows a little Latin. In its fullness, French prosody is not overlooked On the whole, as a grammar, we have seen none of the same size which we can say is its equal.

BOOKS RECEIVED.

Elements of Calculus, by Hardy; and Directional Calculus, by Hyde. From Ginn & Co , Boston.

Selections from Heine's Poems, with notes by Prof H. S. White, Abeille; D. C. Heath & Co. A Practical Delsarte Primer, C. W. Bardeen, Publisher.

PUBLICATIONS RECEIVED.

The *Literary Digest* is the name of a new periodical, published by Funk & Wagnalls, New York. It aims to give a weekly summary of the current literature selected from the best sources, with book reviews; a monthly chronicle of the current events of the world with other valuable features. To the teacher and student who would be informed on all topics at a very moderate expenditure of time and money, this journal seems admirably adapted. Subscription price $3.00. ..The *Herald of Health* published monthly in New York, contains excellent sanitary hints for each month of the year... *Forest and Garden*, published weekly by D. R. Munroe, New York, is doing excellent work in directing the preservation of forests and the ornamentation of public and private grounds....For literary excellence and readable selections the Quebec *Weekly Chronicle*, edited by Dr. George Stewart, has few competitors....The *Journalist* is a bright weekly, devoted to newspapers, authors, artists and publishers. It recently sent out its first series of American editors, which comprised handsome portraits of fifty leading newspaper men, each portrait set in a neat title page of the paper represented....The *Scientific American* contains in its first issue of each month a valuable article on the position of the planets for that month.

Pamphlets Received.

A Suggestion relative to Science Teaching in the Secondary Schools, by Professor G. L Goodale, Cambridge, U. S. A., President of American Society of Naturalists, eight pages. He makes a good plea for the study of the outlines of the natural sciences as *physiography* following a properly written book; and the special study by laboratory or objective work of some one of the included sciences in the true scientific manner.

Reading in Modern Language Study, an essay read before the Modern Language Association, 1890, by Edward S. Joynes, Professor of Modern Languages, University of South Carolina. Forty-six pages. A valuable paper for language teachers.

Calendar Dalhousie College and University, Law department opens Sept. 2nd, *Arts*, Sept 10th, *Medicine*, Oct. 29th. *Calendar McGill University*, examination for *Arts* and *Applied Science*, courses begin Sept. 15th. In *Law*, Sept. 24th. In *Medicine*, Sept. 26th.

Pamphlet showing the proposed enlargement of *Applied Science* courses at McGill University; the MacDonald Technical buildings, the new work-shops, electric engineering, etc.

Horton Collegiate Academy Calendar, Fall term opens Sept. 3rd.

Halifax Ladies' College and *Conservatory of Music* announcement, Autumn term opens, Sept. 10th.

TEACHERS' INSTITUTES.

St. John County Teachers' Institute.

The Saint John County Teachers' Institute, will be held at the Centennial School on Thursday and Friday, Oct. 30th and 31st.

Thursday, a m.—Enrolment of members and other routine business: Papers on Animal Life by Miss O'Sullivan—Standard I; Miss Gregg—Standard II; Miss B. Thompson—Standard III; Miss C. M Hogan -Standard IV.

Thursday, p. m.—Physical Geography in Public Schools, by Edward Manning.

Friday, a. m.—A course of reading in History and Biography, by George R. Devitt. Modellings and Drawings in Primary Schools, ——— ———

Friday, p. m.- Hints suggested by visits to Summer Schools by St. John teachers, by Miss Grace Orr, Miss Murphy and others. Election of Officers. Discussions will follow the reading of the papers.

Wm. C. Simpson, *Secretary.*

Edward Manning, *President,*

RESTIGOUCHE CO. TEACHERS' INSTITUTE.

The Restigouche County Teachers will convene at Campbellton, September 25th and 26th, 1890.

First Session, Thursday 10–12 o'clock.—Opening Address; Enrolment of members and election of officers; address by C. H. Edgett, and paper by Miss Miller on "The Benefits to be derived from Teachers' Institutes,"

Second Session, 14—16 o'clock.—Number—; lesson on—by Miss Barnes; Practical Arithmetic; paper on — by Miss Fleiger; lesson on—by Miss Devereaux.

Public Meeting 19 o'clock.—Lecture by the Chief Superintendent of Education.

Third Session, Friday, 9 -12 o'clock.—Report on manual Exhibit; Lesson on Clay Modelling and Drawing by Miss Galt; Canadian History in Standard IV ungraded Schools; paper on —by Miss McKinnon; School Discipline; Essays on — by Misses Thompson and Turvey.

Fourth Session, 14—16.—School libraries, by C. H. Edgett; paper on "Teaching Music in Schools," by Miss Barnes; Essay by Miss Galt; determining time and place of next meeting; closing. C. P. STEEVES, SEC., *pro tem.*

Campbellton, N. B., August 25th, 1890.

CHARLOTTE COUNTY TEACHERS' INSTITUTE.

The twelfth annual meeting to be held at Saint Andrews, September 18th and 19th, 1890.

Thursday, 10 a. m.—Enrolment, election of officers, addresses, etc.

2 p m.—Paper—"The Newspaper as a Factor in School Education," Mr. W. T. Kerr; discussion to be opened by Mr. W. A. Brodie.

Paper—"How to deal with Backward Pupils" — Miss Agnes Boyd, discussion to be opened by Miss Bessie Howard.

7.30.—Lecture,—"Objects of Natural History in Charlotte County," Mr. W. F. Ganong.

Friday, 9 a. m—Paper.—"How to Teach Spelling."—Mr. J. B. Sutherland, discussion to be opened by Mr. P. G. McFarlane.

Paper—"Temperance Teaching in the Public Schools,"—Miss Annie M. Gillmour, followed by discussion.

2 p. m.—Paper—"Practical Arithmetic."—Mr. G. M. Johnson, discussion opened by Mr. J. S. Lochary.

Discussion:—"The Promotion of Pupils in Graded Schools;" determining time and place of next meeting.

The following arrangements have been made with steamboats and railroads: Teachers who travel by either the Shore Line R.R., or steamer "Flushing," will pay one fare and return on certificate of attendance at Institute. The steamer "Rose Standish" will issue return tickets at one fare. The N. B R R. will sell excursion tickets at one fare for the round trip to St. Andrews and return. When buying your tickets state that you are going to the Institute.

Let every teacher in the County attend the Institute, and take part in one or more of the discussions.

JAMES VROOM, P. G. McFARLANE.
PRESIDENT. SECRETARY.

English Literature for License of Class I. at the June Examination of 1891.

Literary Extracts,—Royal Reader VI.
Meiklejohn's English Language.
Wordsworth's Excursion, Book 1, The Wanderer.

WILLIAM CROCKET,
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Education Office, August 12th, 1890.

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READING Badlam's Suggestive Lessons in Language and Reading, $1.50. Hall's How to Teach Reading, 25cts.; Wright's Nature Readers, Seaside and Wayside No. I, 25cts.; No. II, 35 cts.; No. III, 45cts.

All by Mail for $2.00

LANGUAGE Badlam's Suggestive Lessons in Language, 50cts.; Hyde's Lessons in English, Book I, 35cts.; Book II, 60cts.; Meiklejohn's English Grammar, 80cts.

All by Mail for $1.75

NUMBER
New Arithmetic, - - - - - 75cts.
Badlam: Aids to Number, First Series (one to ten) Teacher's edition, 40cts.; Pupil's edition, 25 cts.; Second Series, (ten to one hundred) Teacher's edition, 40cts.; Pupil's edition, 25cts.; Number Chart, 5cts.
Howland: Drill Card, two cards, - 6cts.
Luddington: Picture Problems, - 65cts.
Pierce: Review Number cards, 2 cards, 6c
Safford: Mathematical Teaching, - 25cts.

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The Shorthand Institute,
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SPECIAL ANNOUNCEMENT.

TO introduce this Institute to the notice of a large number of persons, to whom a knowledge of Shorthand would be useful and remunerative, I am arranging, with the assistance of the teaching staff, the formation of

A SPECIAL CORRESPONDENCE CLASS

for the study of Shorthand, or Phonography, such class to commence study on or about the 1st October next.

The course covered in this class will be precisely the same as that followed in the "Home Course" of the Institute, excepting that one fortnight only will be allowed for the study of each lesson. This restriction is made to prevent interference with the other branches, and to allow the teaching staff to correct all exercises promptly and without interruption. As each lesson may be studied in about two hours the restriction is quite reasonable.

The fee for the Complete Course, including Text Books, will be $4.00. The text books, one copy each, of "The Phonographic Teacher," "Key to ditto," "Manual of Phon," "Key to ditto," "The Phonographic Reporter," "Reporting Exercises" and "Key to ditto," **the price of which separate would amount to $2.35,** and a quantity of special exercise papers.

As the class will not be formed unless one hundred prospective pupils hand in their names, and is limited to one hundred and fifty, it would be advisable to make prompt application for admittance to the class. Without comment upon the low fee asked for this class course, I may mention that it is based entirely on the assumption that over one hundred pupils will commence.

I believe that a class on this plan will be a boon to a number of persons of limited means. It will readily be seen that the recompense for the vast amount of work will be small and hardly pay expenses, but I rely on the advantages to be gained by a practical demonstration of the methods of teaching employed at the Institute to ensure a larger annual attendance, and thus keep up with the demand for competent and practical stenographic business help.

Application forms and circulars will be mailed free to any address.

J. HARRY PEPPER,
CONDUCTOR.
Shorthand Institute, St. John, N. B

McGILL UNIVERSITY,
MONTREAL.

The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 15th. 1890).

DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).

FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.

FACULTY OF MEDICINE—(Oct. 1st).

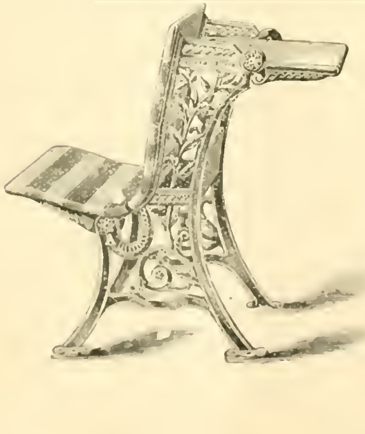
FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).

FACULTY OF LAW—(Oct. 1st)

McGILL NORMAL SCHOOL—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.) **J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.**



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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., OCTOBER, 1890. $1.00 PER YEAR

A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
G. U. HAY, Ph. B., Editor for New Brunswick.

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The REVIEW is issued from the office of Barnes & Co., St. John, to whom subscriptions may be paid if convenient.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

THE attention of subscribers is directed to the special notice in another column.

TEACHERS who change their address at this time of the year should promptly notify us of the fact; as it may save the annoyance of papers going astray and the consequent correspondence.

THE visit of the Governor-General and Lady Stanley to these Provinces has called forth an enthusiasm which springs from loyalty and attachment to our Sovereign; but to the kindness and frank cordiality of the distinguished guests themselves not a little of their popularity is due.

IN another column there is an outline lesson on Canadian History. The teacher begins by getting the pupils interested in local affairs. That is a move in the right direction. In developing ideas of geography we begin with the school-room and move outward. Why not so in Canadian History? The *live* teacher, instead of giving a page to be memorized gets his pupils interested in the subject and afterwards refers them to the printed page for fuller information. But he first gets the pupils interested. Will not others who find Canadian history an unsatisfactory subject to teach, examine their methods, and keep their eyes and ears alert as does "Teacher," and bring the subject home? And when you hit upon a plan that works satisfactorily send it to the REVIEW. The live teacher is not satisfied with waking his pupils up. He goes to work and wakes other people up. When the district finds it has a live teacher it invites him or her to accept an increase of salary. If it does not, so much the worse for the district.

A GENTLEMAN who has been a clear observer of all phases of our educational work, writes as follows:—"What is needed among you as much as anything is an increase of the teachers' salaries. Probably this is not news to you, and doubtless the teachers would welcome most heartily a feasible plan for securing the advance they deserve. The only way to bring it about, so far as I know, is in every way to increase public interest in education, and introduce new things from time to time. If teachers permit the inertia of the public to dominate the policy of the school departments, the results will be deplorable, but there are many signs and many things to indicate that your teachers do not propose to err in this way. Your EDUCATIONAL REVIEW is the principal one, I should say, and the Nova Scotia School of Science the next."

THE progress of the science of sanitation is well illustrated by the prompt manner in which a threatening outbreak of diphtheria in Halifax was suppresed last month, and the disease nearly exterminated quite within a couple of months after the health officers were aroused to put sanitation principles into vigorous effect.

THE University of New Brunswick had an unusually brilliant opening in the first week in October. Prof. Duff delivered the inaugural address in presence of His Excellency the Governor-General and Lady Stanley, Lt.-Governor and Lady Tilley, members of the Provincial Cabinet, and a large assembly of ladies and gentlemen. The matriculating class numbers 26, the largest, we believe, in the history of the university.

The *University Monthly* which has just come to hand is a special number that has been produced with excellent care and taste, and is a credit, not only to its editors, but to the university.

WE have received an admirable pamphlet of some 19 pages, bearing the title, "Notes on the German School by J. B. Hall, Ph. D., Normal School, Truro, Nova Scotia." Dr. Hall has evidently been studying the German school system during his year on the continent with deep interest, in order to produce so striking and inspiring a view of the whole in so short a space. From the clear glimpse given by our enthusiastic author, it is abundantly evident that as a whole the Germans have gone far ahead of us, even in the common school department. Dr. Hall's German studies, we expect, will give a fresh impulse to the good work carried on by the Nova Scotia Normal School.

It is with much pleasure we observe a notice of another work of Dr. Hall's as being ready for the press, viz: "Outlines of Pedagogical Psychology, Logic, and History of Pedagogics." Such a treatise will be a valuable addition to our educational publications.

THE EDUCATIONAL EXHIBIT.

The recent display at the Saint John Exhibition of work done in the New Brunswick Schools, has called forth most favorable comment. It shows what a carefully prepared and wisely administered system of public school education is capable of accomplishing in the hands of intelligent teachers with progressive methods. Men and women who seldom see the interior of a school-room gazed with astonishment at the specimens of manual work done by children of tender years, and contrasted the practical methods of school work to-day with those that obtained but a few years ago.

In completeness this exhibit left little to be desired. There was every grade of work shown, and the Province, as a whole, was well represented. But the great bulk of the work exhibited was from the schools in cities and towns. A few villages were represented, but the country schools sent but a meagre display. But visitors were anxious to know: What are the country schools doing and how are they doing it? The excellent display of manual work from the normal school was creditable to the Province. The work, continued in this line under the skilful guidance of Mr. Brittain, should, at every succeeding exhibition, show better results in steadily progressive improvement of the country schools in manual work. The majority of graduates from the normal school are engaged to teach in country districts. It will be a test, then, of the efficiency of the manual work done in the normal school, if, from year to year, these schools shall show improvement in this respect. They are, perhaps, doing good work already, but through lack of a little enterprise they were not adequately represented. But let the country schools come to the front in future exhibitions.

We would like to see, also, how far the successful example of Miss Orr, of the Victoria School, St. John, in incorporating Kindergarten methods with primary school work is being followed in other sections of the province. The display of the St. John schools in primary work was very creditable.

If there is a lesson to be learned from the educational exhibit it is that schools generally should be represented, and that the *every day* work of pupils should be shown to form an adequate idea of what the pupils are doing, and what progress is being made in our educational development.

N. B. TEACHERS' INSTITUTES.

The second annual meeting of the Victoria and Madawaska Teachers' Institute, will be held at Edmundston, October 23rd and 24th. Inspector O'Brien is president, and with an energetic executive committee has made an excellent programme. A public meeting will be held at which Chief Superintendent Crocket is expected to be present. There will be specimens of manual work executed by pupils. Papers will be read by H. Henderson, A. B., D. W. Ross, E. M. Brundage, Miss Maggie McGill, with illustrative lessons by Misses Sarah Truswell and Gertie Henderson. All the teachers in Victoria and Madawaska should make it a point to attend and help to build up the institute which was so successfully inaugurated last year.

The Northumberland County Institute will be held October 15th and 16th.

St. John and Kings County Institutes will be held on Thursday and Friday, Oct. 30th and 31st. The programme of the former has been already published in these columns, from which it will be seen that a very interesting session is promised.

The Restigouche Co. Institute met at Campbellton, on the 25th and 26th September.

So great an interest was taken in the proceedings that nearly all the teachers in the county were present, besides many others interested in education. Inspector Mersereau called the meeting to order, and made a very suitable address, in which he particularly referred to the history of the Teachers' Institute of Restigouche.

Chief Superintendent Crocket delivered a very happy address at the public meeting on the evening of the 25th, in which he referred to a little chapter in his own history. Thirty-four years ago he had come from Scotland to take charge of the school in Campbellton. He was disappointed in the "box," where he was expected to teach, but Campbellton had made ample amends — first, in giving him one of its fairest daughters for a wife, and second, in providing the fine educational equipments which the town now boasts of.

Papers and addresses were given by Mr. Edgett, Misses M. Miller, M. Barnes, Devereaux, Galt, E. McKinnon, C. Thompson, D. Turvey, and were well received by the Institute.

The Charlotte County Teachers' Institute was held at St. Andrews on the 18th and 19th of September. Over sixty teachers were present and the Institute was a very interesting and profitable one. The Chief Superintendent, Inspector Carter and Mr. W. F. Ganong were present, and took an active part in the proceedings. Papers were read by Miss Agnes Boyd, Mr. W. T. Kerr, Mr. J. B. Sutherland, Mr. G. M. Johnson and Miss Annie Gilmour.

NEXT TERM.

At the end of this month a great number of our teachers in Nova Scotia must pick up their gripsacks and walk into another section. We are sorry that there should be so much of this, both for the teacher's sake, and for that of the section. True, we must always expect promotions. While these may be good for the teacher, they do no good to the section. But there should not be so many occasions for promotions. Were the salaries in one section as good as in another there would be none. But every annual meeting brings in a number of trustees whose policy is that of trying how far they can cut down the school expenses and still keep a school running. If the school has made progress during the preceding years they are successful in turning it back, and fancy they have done a praiseworthy act because they have saved a few dollars to the district. Law can hardly be called to meet this evil directly. The "one year" system of teachers' engagements would tend to improve matters, we would expect; but the most work can be done by a teacher who makes himself a powerful factor not only in the school room, but in all the public works and movements in the section. The teacher should be more or less a public man, heard and *felt* by all men.

N. S. EDUCATIONAL ASSOCIATION.

This convention, which is to meet in the provincial metropolis during the Christmas holidays, is likely to be one of the most important, if subjects now engaging the attention of our educationists are to be discussed. At last we are within measurable distance of having two incompatible courses of study replaced by one. Two courses of study; the one recommended to be followed as an harmonious scheme of general education; the other not recommended, but made compulsory by an absolute fiat fixing the syllabus of examination for teachers prepared in the schools. Then, how are the various subjects to be balanced in the new course? We suppose when the final compromise is made there will not be a single teacher in the province who will approve of it as a whole. And if it did suit one perfectly the balance of feeling against it would preponderate more than in the former case. Such a thought must make us feel the necessity of meeting with our minds made up to be very considerate to views which are not our own; because we may feel sure that no one with an opinion of his own can exactly coincide with us.

A general course of study must, of course, be behind the leading thought of the age. The progressive must be handcuffed to the non-progressive. The latter may be dragged on faster; but the former must step slower. On the whole, however, the common consensus of humanity seems to favor the phalanx as the most effective fighting formation.

ASPIDIUM FRAGRANS.

One of our exchanges seemed to think the use in our last issue of the botanical names, *Aspidium fragrans*, etc., discovered in the Cobequids near Parrsboro, was funny. This fern has no common name because it is not a common plant. Very few Nova Scotians or New Brunswickers have ever seen it or will ever see it. Secondly, the scientific name is known in every school in the land in which a copy of "How Plants Grow" is used, we mean MacKinlay's last edition, lately published, which contains a description of all the ferns in the northern half of the continent.

Why is it that this arctic and most exquisite of the shield fern tribe, grows in dwarf but fragrant clusters in solitary stateliness, from the ledge of some nearly inaccessible cliff, over a water-fall which gouges its wild way into Pirate's Cove on the Strait of Canso; and over the Niagara of Nova Scotia, where the tawny flood of the Moose river leaps from the Cobequid Range to the lands beneath; and over the crystal Minnehaha, where the falling white foam forms a portiere in perhaps the most picturesque slyvan cave scene of these provinces? How could this delicate little plant, this fragrant arctic member of a coarse and common family, plant itself in so few and at so distant points? It never could. It never did. It tells a pathetic tale. Long ere Glooscap and his people played their pranks in the virgin forests of Nova Scotia, when the glacial winter of ages was slowly retreating northward, and the arctic sting was even in the summer breath, then *Aspidium fragrans* probably flourished in every ravine and along every stream. Possibly the increase of temperature made the hobitat less favorable, and the fern is slowly but surely dying out, remaining yet only in the most favored spots where deep gorges and the vapor from the water-falls combine to keep it cool. It is a most interesting relic of a past age; older than the red-man's skull, or the treasures of the stone age.

WEBSTER'S INTERNATIONAL DICTIONARY.

This great work has just been published by G. & C. Merriam & Co., Springfield, Conn. It marks another era in the history of the famous dictionaries that bear the name of Webster, and is the legitimate successor of the great Unabridged Dictionary, published in 1864. The International Dictionary is the "Unabridged" thoroughly re-edited by Dr. Noah Porter, of Yale University, with a staff of co-laborers; the work extending over ten years, costing in editing, illustrating, etc., over three hundred thousand dollars. A glance through its pages shows its completeness as a work of reference, as well as its marvellous typographical excellence. In an introduction of 100 pages it includes a comprehensive history of the English language. The body of the work comprises nearly 1,700 pages, with over 114,000 words, with pronunciation and definitions, accompanied by nearly 4,000 illustrations. In an appendix of over 300 pages we find a Dictionary of Noted Names of Fiction; a Geographical Dictionary; a pronouncing Biographical Dictionary, etc., with a selection of pictorial illustrations — the whole work of over 2,000 pages forming a library in itself. The work is for sale by Messrs J. & A. McMillan, St. John; price $10.

The school trustees who would invest in Webster's International and place it in the school room would confer an inestimable boon on the rising generation.

GEOGRAPHY.

The text book, with its regular order of procedure—area, population, coast line, mountains, rivers, products, etc., is a capital arrangement for the review of geographical study or for a geographical book of reference. But it is, in the first place, monotonous to the young scholar; and secondly, the associations by which the facts are linked in memory are so artificial and removed from the practical applications of geography, as to be but of little use in life afterwards if the facts even should be remembered in their original mechanical fashion. We would recommend a thorough oral course of geography in the common schools, using no apparatus except maps, and a teacher who knows geography — a phenomenon that is very rare, and will be until teaching becomes a profession.

Geography is of use to us on account of the dealings between peoples of different countries. The first and yet the most important are commercial dealings. In every home numerous articles are used, which, when traced backward in the line of their transit to the point of production, will carry us through the most important parts of the world, leaving a picture on the mind which cannot readily be effaced, and arranging the knowledge in a form which is always ready for utilization, and in fact prone to suggest original developments of trade.

Take tea. It is carried from the village store in a wagon on the high road. It came to this village from a town or city in large cases with strange letterings, and was carried on a railway train. It came into the city from a large vessel, which hoisted from out of its hold many hundreds of cases. Trace the high road on the map of the village. Trace the railway to the city. The high road passes through a wood, over a brook, around a mountain, through a marsh. We know the people and how they earn their livings. We next have a picture of the life of the city, the number of people in it. How they earn their livings. The ships came in with merchandize of all kinds, but we follow now the tea ship far across the ocean to China. Suppose we are in that distant country. We see a tea farm which is pictured. The Chinaman is pictured at work. What he does to the tea is shown. How much tea does he prepare in a year? What does he get for it? How does he live on it? What is his house like? His family like? Describe them at their meals and the articles which they eat. Then follow the tea down to the great warehouses at the shipping towns. How many Chinamen are doing as the one we just saw? How many pounds of tea are brought down from the country to the shore? How many tons would this make? If it was all piled up in a cubical mass, how large would the pile be? This is carried to various parts of the world, and the Chinese get money for it, with which they buy articles from other countries not produced at home. What articles do the Chinese take from other countries? Our vessel is loaded, and starts out of the harbor. Describe the appearance of the city, its architecture as seen from the water. Describe the appearance of the land; whether rocky, forest covered, covered with farms or villages, and give an idea of the population. What are most of the people doing? Have they a Sunday, and do they go to churches? What do the great majority of them believe in? Then the ship passes point after point of the coast, passing through straits, now out of sight of land, next under the influence of a monsoon, then in a calm or in a typhoon. India is passed. Ceylon may be sighted and described. The Red Sea is entered, under a tropical sun. The coast of Arabia is seen on one side, and in the distance the mountains of the Sinai range, or the low, brown coast of lower Egypt. The Suez Canal is passed through. The great work and great traffic is described. Then the Mediterranean is entered, and on the right and left are pointed out with a few words of living description the most notable features of this historic coast; and so on until the vessel arrives at its port. Then how much tea is taken into our country? How many pounds per individual? etc.

Were a teacher able to give a lesson of this kind geographically and correctly, the lesson could be made second in value to actual travel; and all geographical facts would be studied in their natural relationship, and would make the pupil so far a man of the world. But where is the teacher who can give from day to day lessons of this kind? If we could find him he would be more valuable than the average clergyman, lawyer or doctor. He would require as much special study, and even more tact.

What an amount of useful never-to-be-forgotten knowledge could be acquired by lessons of this kind on cotton, silk, linen, leather, gold, silver, copper, iron, lead, tin, pottery, paper, starch, sago, sugar, etc.

The tea of the world is worth $82,000,000 per year, at 20 cents per pound; the coffee $210,000,000 at 25 cents per pound.

Great Britain is the great tea drinking section of English people; the United States the great coffee drinking section.

Astronomical Notes.

VENUS.

According to the almanac, Venus will be at her greatest brilliancy on October 29th. It is at this stage of her career as evening star that she should be easiest to see in the afternoons, and should look her best in the evenings. But such is not always the case, and it will not be so this time. When last she was at her greatest brilliancy as evening star—in March, 1889—she was 66 degrees above our horizon in the middle of the afternoon, when on the meridian, and in the evening she remained above our horizon for nearly four hours after sunset. But at greatest brilliancy this year her meridian altitude will be only a fourth of what it was then, and in the evening she will remain above our horizon only one hour and a quarter after sunset. So it will not be nearly so easy this time as it was last to pick her out in daylight, and one will not be so apt to mistake her for an electric light after dark.

When Mars was at his greatest brilliancy last May, he was highest up in the sky at midnight, and so afforded us a first-rate opportunity of appreciating to the full his extraordinary brightness. If we could only have Venus on the meridian at midnight, when at her greatest brilliancy, what a glorious sight it would be. But we can't have that. Mars is an *exterior* planet, revolving in an orbit outside that of the earth, and so we can have him at any angular distance from the sun from 0° up to 180°. But the orbit of Venus lies *inside* that of the earth, and so far inside that we can never see her at a greater angular distance from the sun than about 45°. This angular distance from the sun is called her *elongation*, and when this is greatest she is at what the almanacs call her "greatest elongation." It happened this year on September 23rd, and her elongation then was $46\frac{1}{2}°$.

This matter of elongation—and one or two other matters as well—may be studied to advantage by means of a bit of construction: Take a sheet of paper and describe a circle on it; call the centre S and let it represent the sun. Let the circumference represent the path of Venus around the sun. Take a point anywhere on the circumference as the position of Venus at a given time, and call the point V. Take another point outside the circle to represent the earth, and call it E. Join V S, and E S, and E V. The angle at E is the "elongation" of Venus for her given position. When V is in the same straight line with S and E, and beyond S, as seen from E, this angle is 0°. In this position Venus is said to be "in superior conjunction." When V is in line with S and

E, and between them, the angle at E is again 0°, and then Venus is "in inferior conjunction." If you move V round the circle, from superior conjunction to inferior conjunction, in the direction opposite to that in which the hands of a watch move, you will have a representation of her motion relative to the earth and sun during her career as evening star.

At the beginning of one of these evening star seasons she is at superior conjunction, on the farther side of the sun. Here her elongation is 0°, and she sets with the sun As she moves round to the left the angle S E V opens out, and in a month or so we can see her above the western horizon after sunset. As she moves farther round, the angle at E grows larger and larger, until the line E V becomes a tangent to the circle. Then her elongation is greatest. How great this greatest elongation of hers is you can find out by solving a simple problem in plane trigonometry. The angle at V is a right angle, because E V is a tangent. (See Euclid III.) The sides S E and S V are the distances of the Earth and Venus from the sun. The relative values of these distances are all you need, and any astronomy book will give you them With these data, find the angle S E V, and you will have Venus' greatest elongation. Your value will only be the *mean* value, but it will not differ much from the exact value given in the almanac for any given greatest elongation.

As V moves round past the point of greatest elongation, the angle S E V begins to decrease, and continues so until it closes up altogether again at inferior conjunction. Then Venus sets with the sun again, and her career as evening star is over for that season.

So much for elongation. But that same diagram will help you to understand some other things about Venus. You all know what is meant by the *phases* of the moon—the new moon phase, the half-moon phase, the full moon phase, and so on. To the naked eye Venus seems always full. But not so to the telescope. As seen through this instrument she passes through all the phases of the moon from new to full. This is because she is an *inferior* planet, and your diagram will help you to understand it. Put her at superior conjunction, in line with E and S, and beyond S. There she shows to E the same face which she shows to S, and, as the face which she shows to S is always fully illuminated, she is then "full" as seen from E. Of course, if she were really in the plane of your diagram, she could not then be seen from E at all, and, as a matter of fact, she never can be seen there by the naked eye. But, as a general rule, she can then be seen through a good telescope, because, as a general rule, when she is in superior conjunction she is not in the same plane as E and S, but is either above that plane or below it. But the chief point to notice at present is, that supposing we could see her at superior conjunction, we would see her *full*. Now move her round into inferior conjunction. There her illuminated side, the side that is turned towards S, is the side that is turned away from E, and the side that is turned towards E is wholly illuminated. In this position she turns her dark side towards us, and is in the "new moon" phase. When she happens at the same time to be in the same plane as E and S, and so comes directly between us and the sun, we see her as a *dark* spot moving across the sun's face. And then we have a transit of Venus, as we had in December 1882, and in December 1874, and as we shall nearly have in December, 1890, but shall not really have in December again until the year 2117.

And so, at inferior conjunction—at the end of her career as evening star—we have Venus in the "new moon" phase; and at superior conjunction—the beginning of her career as evening star—we have her in the "full moon" phase. Study the case for all the positions on your diagram intermediate between these, and you will see that she must pass through all the intermediate phases. In any position, you will find, with the help of a little geometry, that her phase depends on the size of the angle at V. The "half-moon" phase falls when V is a right angle, that is, at the time of greatest elongation.

The brightness of Venus at any given time depends partly on her phase at that time, and partly on her distance from the earth. It depends also on several other things, but these are the most important factors. As she moves round from superior to inferior conjunction, she is coming nearer and nearer to the earth, and the apparent size of her disc is therefore becoming greater and greater. At the time of greatest elongation she shows us a disc six times as large as at superior conjunction. But, as we have already seen, only half of this enlarged disc is illuminated: and so, at greatest elongation, her brightness is only three times—not six times—what it was at superior conjunction. After greatest elongation her brightness continues to increase until it rises to four times what it was at superior conjunction. Then the rate of decrease due to phase overtakes the rate of increase due to nearer approach, and from this stage—the stage of greatest brilliancy—until inferior conjunction, the brightness decreases.

During October and November Venus will be a beautiful sight in a telescope. The afternoon or early evening will be the best time for observation. On October 17th she will be very close to Antares (see map in May REVIEW).

A. CAMERON.

Yarmouth, N. S., Oct. 1st, 1890.

For the Review.]

PRACTICAL CHEMISTRY.

J. Brittain, Normal School, Fredericton.

The following apparatus should be obtained as a pre-requisite for the successful prosecution of this study:

2 Wide-mouth, 6-oz. Quinine prescription bottles of *clear* glass. It is important that the calibre of the neck should get gradually but slightly narrower as it descends, in order that the cork will become tighter as it is driven in farther.—20c.
1 Wide-mouth, 2 oz. Prescription bottle.—6c.
1 Soda or Pop bottle.
1 Doz. good corks which will fit the 6-oz. bottles tightly and still leave one-fourth of the depth of the cork projecting above the neck of the bottle.—10c.
4 Pieces of window glass about 3 in. square. A mechanic will cut them out of a broken pane of glass for you.
1 Pair Steel Forceps.—10c.
1 Triangular File. —10c.
1 Round File.—12c.
6 Test Tubes, each 5 in. long.—30c.
4 Ignition Tubes, each 7 in. long.—40c.
2 Doz. corks to fit the Ignition Tubes.—6c.
2 Doz. corks to fit the Test Tubes.—20c.
1½ Feet Rubber Tubing, ⅜ in. inside diameter.—20c.
6 Pieces Soft Glass Tubing, ⅜ in outside diameter, each piece about 18 in, long.
1 Piece Glass Tubing, ½ in. outside diameter, 18 in. long.—10c.
1 Glass Stirring Rod.—5c.
1 Large Iron Spoon.
1 Small Iron Spoon.
1 Yard Copper Wire about the size of broom wire.
1 Square Earthen Dish about 5 in. wide.
1 Square Earthen Dish about 3 in. wide.
1 Square Glass Dish about 3 in. wide.
1 Spirit Lamp with suitable wick and glass cap.—25c.
4 Reagent Bottles, ¼ pint. One each for sulphuric acid, hydrochloric acid, nitric acid, and ammonium hydrate. Bottles with ground-glass labels should be preferred.—60c. to $1.
1 Cork Borer, ½ in.—40c.
1 Wooden Test Tube Holder (Fig 1.) This may be made of cedar, or other soft, elastic wood, by the teacher or one of the larger pupils.

1 Pneumatic Trough. A rectangular tin vessel 12 in. long, 6 in. wide, 5 in. deep, will answer well. The shelf of the trough should be made of a piece of tin 3 in. wide (with a hole ¾ in. in diameter in the middle) bent so that it will slide upon and be supported by the longer edges of the trough. When the shelf is placed in the trough the hole should be 2 in. below the rim. A tinsmith will make the trough.—40c.
1 Wooden Tray, about 24 in. long, 15 in. wide, 3 in. deep, for holding and carrying the apparatus in use.—50c.

Chemicals.

1 Pint Alcohol (Proof),	55c.
2 Oz. Ammonium Chloride,	5c.
¼ lb. Ammonium Hydrate (Strong),	12c, (in bottle).
2 Oz. Bleaching Powder,	3c,
1 Oz. Bromine,	40c. (in bottle).
2 lbs. Hydrochloric Acid,	30c. (in bottle).
½ Oz. Iodine,	20c. (in bottle).
½ Oz Litmus (Powder),	10c.
2 Books Litmus Paper,	10c
Magnesium Ribbon,	25c.
½ lb. Manganese Dioxide,	5c.
½ Lb. Nitric Acid (Chemically Pure),	30c. (in bottle).
1 Oz. Oxalic Acid,	5c.
2 Oz. Phosphorus,	25c. (in bottle).
⅓ Oz. Metallic Potassium,	60c, (in bottle).
½ lb. Potassium Chlorate,	20c.
2 Oz. Potassium Hydrate,	15c. (in bottle).
1 Oz. Metallic Sodium,	85c. (in bottle).
2 Oz. Sodium Hydrate.	55c. (in bottle).
2 Oz Sodium Silicate,	20c.
¼ lb. Sulphur,	5c.
½ lb. Granulated Zinc,	35c.
Metallic Antimony,	10c.
2 lbs. Sulphuric Acid,	40c. (in bottle).
¼ lb. Mercury,	35c. (in bottle).
½ Oz. Aluminum Wire.	
¼ Oz Silicon.	
1 Small Piece Platinum Foil.	

The prices given will show that both apparatus and chemicals can be bought for about $11, without including the aluminum, silicon, and platinum. These prices will also serve sometimes in guiding or correcting the judgment of the druggist from whom you are purchasing. The price of the bottle, properly stoppered, is usually included. Small bottles can easily be got, without cost, for the other chemicals. As phosphorus must be kept in water, the bottle containing it should be enclosed in a small tin can, to guard against breakage by frost or otherwise. The bottles containing the sodium and potassium should also be so enclosed.

As several of the chemicals are poisonous, a small, cheap cabinet should be obtained for the whole, which should be kept locked.

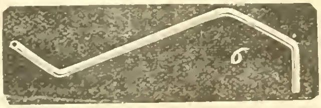
The apparatus will last for years, and the quantities of chemicals given will, in most cases, be found sufficient for repeating the course several times. While a course in experimental chemistry at a high school, or at the normal school, would be of advantage, no teacher who has not had such preparation need be afraid of failure. Full directions, with all necessary cautions, will be given for the performance of each experiment.

In order to insure success, the teacher should perform each experiment himself shortly before it is to be done in school. There, one or more of the pupils should be allowed to assist (in turn) in the experiments, and sometimes to perform them under the teacher's direction.

Our apparatus being ready, we will have some practice in manipulation:

Put some alcohol into the spirit lamp, and insert a good wick. Make a scratch directly across a piece of glass tubing with the edge of a triangular file. Hold the tube with the thumbs opposite the scratch, and with the fingers on the same side of the tube as the scratch; use force as if you intended to bend the tube backward at the scratch. The tube should break squarely off. Round the sharp edges of the glass by holding them in the flame of the spirit lamp until red hot.

Take a piece of $\frac{3}{8}$ in. glass tubing, about 18 in. long. Hold it in the upper part of the flame, turning it so as to heat an inch or more uniformly. When the glass begins to soften, slowly bend it to the required angle, and allow to cool gradually. Make two other bends in the same plane, giving the tube the form shown in Fig. 2.



Notes for Teaching Music by the Tonic Sol fa Notation.

Ninth Paper.

First, note at the end of this paper a few corrections on the last, which may have caused some difficulty.

We have looked at transition into the right hand column on the modulator, *i. e.*, into the first sharp key, Key G, where s becomes d, and the fourth note of the scale f is sharpened to give the seventh note, the t of the new scale. If we go into the second column to the right, again the s becomes d, the f is sharpened and becomes t, and all the other notes take the corresponding places and have the character of these respective notes of the scale. Look now at the d in the central column and the d in the second column to the right. We see that it has been raised one octave and one tone. Disregard the octave and think of two removes as raising the pitch of the d one tone. We may then say

2 removes or 2 sharps give us Key D
4 " " 4 " " " Key E
6 " " 6 " " " Key F (sharp)
Again 1 " " 1 " " " Key G
3 " " 3 " " " Key A
5 " " 5 " " " Key B.

We shall now look to the first left hand column. On looking at the modulator we see that f becomes d. So the lower tetrachord d r m f becomes the upper tetrachord s l t d of the new key. All the other notes fall into their proper places, except t. Its flat, which we call ta, becomes f of the new scale. This is just the same change that is made in returning from the key of G into the central column of the modulator, which is understood to represent the key of C.

The transition into the first column to the left comes next after that into the right in teaching. Where s becomes d is the easiest transition, and where f becomes d is next. In whatever key we are singing the first remove to the right is the easiest, and the next easiest is one remove to the left.

Let the teacher point on the modulator such an exercise as the following:

No. 1.

| d :— | m :f | s :— | d^1 :t | l :— | — :—‖

Draw attention to the weeping l. Then point No. 2.

No. 2.

| d :s | f :m | r :d | d^1 :t | l :s | f :—‖

Let the teacher now point and sing No. 2, but to the syllable te; sing the flat note td and ask the class what the notes d^1 t l s sound like—s f m r d. Note how te has lost its brighter and assumed a duller character, and how the lah now resembles doh. The class will feel that while the syllable te was sung it was not the note t, but a sound a little lower. Give the pupils the name for this note ta. Ask the class to sing No. 2 to the teacher's pointing on modulator, only pointing not te but ta, after the teacher has sung it over to them. Next point the exercise on the modulator at d^1, passing into the side column ^{D1} s f m r d. Hold the bridge note *well* to the syllable soh, in order to establish in the pupil's mind that the note has got a new character; not the strong, firm, restful character, but the grand, bright effect of soh.

This changing of the mental effects of sound may be suggested to the pupils thus: Picture Farmer Jones working in the field, and then introduce to them Captain Jones of the volunteers. In his uniform, at the head of his men, he seems quite a different person. Next introduce him in his boat as a fisherman. The difference of dress and position seem to give him a different character. After the children have got familiar with one note of the scale taking the character of another in changing key, the pupils may be got to make any change of key if the teacher be careful. This may be done either on the modulator or with the manual signs. Let him stop at any note of the scale. Tell them now to think of any other note of the scale; sing that syllable sufficiently long to impress the new character, pointing to the corresponding note on the modulator, or making the manual sign. When this new character is firmly established in the mind, go on making other signs, or pointing on the modulator, and the children will make any change without feeling the difficulty, and enjoying the exchanges in the character of the notes. This must not be tried until the class get a few lessons in transition. Let the teacher point the following on the modulator, passing into the left hand column at the bridge note, sustaining the sound on the new syllable thus : fah d——

No. 3.—*Key C.* *Key F.*
{ | d :r | m :f | ^{F}d :— | r :m | f :m | r :d
Key C.
{ | t_1 :d | r :m | ^{D}f :— | m :r | d :t_1 | d :—‖

After this has been done with ease on the modulator, it may be written on the blackboard, and sung from the notes.

Let the teacher try to get the class to discover that this change into the column on the left, the flat keys where the distinguishing note te·is changed into the flat fah, which is a duller note, takes some of the brightness out of the music.

No. 4.—*Key D.* *Key G.*
{ :d | m :— | m :f | ^{F}d :r | m :f | s :— | —
Key D.
{ :^{s}d^1 | t : l | s :s | f :m | m :r | d :— | —‖

The teacher may multiply examples. Be careful to hold the bridge note with its new name.

Music for schools should not be written in four parts, but two part harmony, with an *ad lib.* bass. The easiest way in which children can be got to sing in parts is probably on the modulator, following two pointers. First one part may sing d, and the other the notes of the DOH chord up and down. Then change parts. Then this may be varied, still using only the notes of the DOH chord. Then such an exercise as the following may be pointed the two parts at the same time, the left hand pointing the lower part and the right hand the upper. Then change parts.

No. 5.—*Key C.*
{ d r m f s l t d^1 d^1 t l s f m r d
{ d t_1 d r m f s l l s f m r d t_1 d

Other simple exercises may be pointed, using the interval of a third, varied by a fifth and an octave. Rounds are also very useful for introducing part singing, because they are generally simple, interesting, and chiefly because each part is always singing the melody. This point indicates that if children are to sing in parts there should be melody in the alto as well as in the treble, and the intervals comparatively simple.

CORRECTIONS.—p. 51, first column, 10th line, read "between r m"; middle of column read "m r d t_1 d". 6 lines down read "then in the first key". Second column, 2nd line, read "F (sharp)". 23rd line read "taatai." 24th line read "half pulse". Near the foot of column read

{ | d : d . d | d,d.d,d: d | m : m . m | m,m.m,m: m
{ | s : s . s | s,s.s,s: s | d^1 :d^1.d^1 | d^1,d^1.d^1,d^1 :d^1‖

For the REVIEW].

Canadian History, in Standard IV. Ungraded Schools.

At the earnest request of Inspector Mersereau, I send you a report of a lesson given to the 4th grade in my school. I hope this will lead to an interchange of ideas on this subject through the medium of the REVIEW, as my own method seems to me to be far from satisfactory, though the Inspector is good enough to be pleased with the results.

The class before me has drawn a map of the county, and knows why the county is divided into parishes. It has also drawn a map of the Province, and has a pretty clear idea of its divisions and why they were made. This they did in the 3rd standard, and at the same time we picked up scraps of local history, such as incidents in life of early settlers, etc., from some of the oldest inhabitants.

Before the school opened the boys were talking very earnestly together, and I heard the word "election" frequently used; so, when the class was before me I proceeded as follows:

TEACHER. What were you talking about so earnestly this morning before the bell rang?

PUPILS. We were talking about the election of councillors.

T. How many councillors are elected?

P. Two for each parish.

T. What two are going to be elected for this parish?

P. There are four candidates, and the two that get the most votes will be elected.

T. Each voter can vote for how many candidates?

P. Two.

T. Whom is your father going to vote for, John?

JOHN. Mr. B. and Mr. J.

T. And whom does your mother intend to vote for?

All boys—(laughing). Women don't have votes.

T. No? Why not?

Pupils, puzzled, hazard various answers.

T. Whom does your brother Charles vote for, James?

JAMES. He does not vote yet.

T. Why?

J. Because he is not 21 years old yet.

T. Whom does you brother, Aleck, vote for, Thomas?

THOMAS. He does not vote because he is not taxed on any property.

T. Then, who are the voters of a parish?

PUPILS. Men over 21 years of age who own property and pay taxes on it.

Here follows a short talk to illustrate that *income* is the equivalent of property in entitling one to vote, how the voting is conducted, etc.

TEACHER. What are councillors elected for?

PUPILS. To makes laws for the county, and appoint such officers as constables, tax collectors, etc., to see that the laws are carried out.

T. Then, we do not make laws for ourselves?

P. Oh, yes, we do. We send two men from each parish to do just as we would do if we were there.

T. Why do we not all attend the council?

JOHN. We could not get a building large enough to hold us all.

THOMAS. It would be a great waste of time for a larger number to go when two can do just as well.

JAMES. These two represent all the people in the parish.

T. Do you know about any other election?

P. Yes. The local election.

T. Why you call it *local?*

P. To distinguish it from the Dominion election.

JAMES. Local elections are held in the Province every four years, at least.

T. Where do the members sit?

JOHN. In Fredericton, as it is the capital.

This is the way I try to draw from the pupils what they know as a basis upon which to build their future historical knowledge. When their knowledge is at fault I tell them in such a way as to impress it on their minds in the strongest manner possible, sometimes even resolving the class into a miniature House of Assembly with myself as speaker for the occasion.

My object is to give them a clear idea of responsible government as we have it now. Then I can, by contrast, lead them to see what irresponsible government was like, and they will thus appreciate the boon conferred upon us in 1848.

In my next I shall gives notes of a lesson intending to show the importance of confederation, and the causes leading up to it. TEACHER.

Northumberland County, N. B., Oct. 1st, 1890.

The women teachers of Germany, besides a great pension association, have had an insurance society of their own for the last six years. For a monthly fee of twenty-five cents a member can, in case of sickness, draw $2.50 a week for thirteen weeks and for the same period again after an interval of six weeks.

For the REVIEW].

The Teacher's Work and Preparation.

At the opening of the present term many teachers have, for the first time, entered upon their work, others have taken charge of new schools, while some have returned to the school which they taught during the past term. All will, however, find difficulties to encounter and will spend weary hours in thinking how they can best overcome them. I sometimes think teachers undo each others' work — that is, they leave out some important subject which has been taught by their predecessors.

I have at present, charge of a school in which the pupils are much further advanced in reading than in any other subject — but the pupils in Reader V have studied very little Canadian history, no chemistry, very little grammar, and no elementary natural history, nor temperance; and the other classes were graded in the same way. Why should they have been allowed to enter Grade V, while actually not doing the work of Grade IV? Parents perhaps urge the teachers to "promote" their children, taking reading as the basis, thinking, no doubt, that other subjects are of minor importance; but a teacher should use her own judgment. Some teachers do not wish to take the trouble to follow the plan mapped out for them in the Course of Instruction. "It is too much trouble to teach all the subjects to so many grades, I will teach the easiest and let the rest go." This must be the line of reasoning some teachers follow, or the results of their labor would be different.

I do not wish to censure my fellow-teachers unduly, but if anything I have written will prevent any teacher from falling into the error I have mentioned, I shall be quite willing to bear any criticism my remarks may call forth.

I think care should be taken by every teacher to give instructions in *all* branches required. Else how shall they say that they have taught diligently and faithfully? And surely we are all bound to try to do that. A teacher must give the very best of her thoughts to the profession, if she wishes to be successful. The same method which would be successful if brought to bear on one pupil will not suit another.

Oral lessons, if properly applied, are of great benefit, but these must be diligently prepared, simplified, and continued with an end in view, or they will produce no lasting result.

Canadian history is not so much taught as British; at least, I have found this to be the case in my experience as teacher. Perhaps I give it too prominent a place in my school, but I certainly think Grades IV and V should be given lessons in this important subject.

We need to be conscientious in our work. It is not the amount of work we can do in a day, nor is it an endeavor to please parents, inspector, or other school officers, which should be our only motive; but the knowledge that it is our *duty* to do our work in the very best manner we can, that should stimulate us to greater efforts. God sees our work and will help us to be diligent if we only take Him as our guide and counsellor. CIE-CIE.

For the REVIEW].

Kindergarten Methods in Primary Schools.

Kindergarten methods may be used to great advantage by the primary teachers if they will give the subject thoughtful attention.

There are ten gifts, so called by Frœbel, the founder of the Kindergarten, used, and these begin with the solid, proceeding to surface, line and point. The occupations which are closely connected with these gifts begin with the point, proceeding through the medium of line and surface to solid, and these occupations tend to emphasize the knowledge gained by the lessons on the gift.

Frœbel intended by the Games and Songs connected with the gifts and occupations that a harmonious development of body, mind, and soul should take place. Finger-Plays by Miss Emilie Poulsson, 57 Chestnut St., Boston, is a little book of great value to all teachers of little children. Miss Poulsson will send it to any address for $1.

The first gift consists of six worsted balls of different colors — red, yellow, blue, green, orange, and purple. Lessons on this gift open to our little pupils the possibilities of language, number, form, color, motion, direction, surface, and the qualities, smooth or rough.

In the first lesson, which might begin in a variety of ways if the children have not seen the balls before you hold the red ball and ask, "What have I in my hand?" Show them how to make a nest out of their hands, drop the ball in their nest, and sing,

My little ball lies in its nest
So quiet and so still,
I'll gently rock it till it sleeps
And keep it well I will.

"Where are your hands?" is asked and the answer comes, "Around the ball." Then a conversation is held about things that go round, and things which are round, and while singing the song,

My red ball likes to wander from one child to another
And wishes many happy days,——

slip the ball around from one to another. Draw the picture of the ball and count them at the close of the lesson as they are placed in the box.

In a series of lessons which proceed slowly language is particularly emphasized.

By holding the ball by the string which is attached to it and swinging it up and down, round and round like a hoop rolling, left and right like the pendulum of the clock, ideas of direction and motion are gained.

Songs and rhymes are used and motions made, as the little ones are happiest when talking to their playfellow. Imitating the church bell they sing,

Bell high in the steeple,
Calls to church the people,
Ding dong, ding dong,
Ding dong, bell.

Making the motions they say:

Round and round like the sun so bright,
Round and round like the moon at night.

The balls are rolled from one to another and as they go from side to side count them to keep attention and to teach number. Again they sing,

My ball I want to roll you,
Once, twice, three times, four times, five times, six times.

It is noticed how noiselessly the ball rolls because it is soft and that it rolls because it is round.

We talk about the different colors and think of flowers, fruit, vegetables, etc., the color of our ball, and point out things in room as Lizzie's ribbon, Tommy's tie, etc.

As the balls are held up, the strings twisted together, the beautiful Bible story of the first rainbow is told.

They are asked to think of cherries and to find the ball which resembles them in color. Next, to think of the cherry's shape and the questions are asked: "Can you bite it easily?" "And why?" The qualities soft and hard are brought out in contrast to each other.

Of what the ball is made is talked about, and rubber and wooden balls are shown and the difference noted. Short stories are told, or little conversations held about our pretty worsted ball, of the yarn and what it is, of a visit to a farm and what we saw there, of the sheep that did not want to wear its heavy coat in summer and so gave us his wool, of the mill, of the spinning wheel, and the dye-house.

"Babyland," for February, 1889, has this story in rhyme,

Once a little baby,
On a sunny day,
Out among the daisies
Took his happy way.
Little lambs are frisking
In the fields so green,

While the fleecy mothers
All at rest were seen.

For a while the Baby
Played and played and played;
Then he sat and rested
In the pleasant shade
Soon a sheep came near him,
Growing very bold,
And this wondrous story
To the Baby told:

Baby's little blanket,
Socks and worsted ball,
Winter cap and mittens,
And his flannels all.
And his pretty afghan
Warm and soft and fine,
Once as wool were growing
On this back of mine!

And the soft bed blankets,
For his cosy sleep,
These were also given
By his friends, the sheep.
Such the wondrous story
That the baby heard:
Did he understand it?
Not a single word!

In answer to questions and in conversations, complete sentences are always required of the pupils, and if they are taught to speak well they will read with expression.

These balls furnish suggestions for number work as:

I have 3 cherries and Jessie gives me 2 more. How many have I?

If there are 4 bluebirds on a tree and one flies away, how many are left?

3 green apples and 2 green apples are how many?

I divide 6 oranges between 2 girls. How many did each receive?

4 purple pansies and I drop one. How many left in my hand.

The primary teacher possesses in this gift "A mine of riches," and as she moves the ball up or down, to or fro, or places it in the tiny hands of the child that make a nest to receive it and transfigures it into a bird she is always opening the door that leads to all knowledge. And when we recall the familiar definition, 'the earth is round as a ball' it would seem as if in the selection of this dainty toy for early educational purposes that Frœbel had been inspired."

D.

The Halifax Ladies' College has opened with a larger attendance of students from abroad than ever before.

For the REVIEW].

The Twelfth Convention of American Instructors of the Deaf.

This convention was held from the 23rd to the 28th of August in the New York Institution, where, forty years ago, the first one assembled. At that time only about thirty-five delegates were present, representing six schools. At the one recently held nearly four hundred delegates were present from all parts of the United States and Canada, representing over sixty schools. Dr. W. Wilkinson, of the California Institution, was elected president, and J. Scott Hutton, of Halifax, was elected one of the vice-presidents.

Those who were present could not but be impressed with the ability and zeal of those assembled, both deaf and hearing. Though a diversity of methods was represented, yet all were united in purpose, having for their common aim the greatest good for the deaf. Perfect harmony and good feeling prevailed in all the discussions, and each seemed anxious to learn all the experience of others could teach.

A very interesting feature of the convention was the presence of a large number of deaf teachers, who, in themselves, by their papers, and ready and intelligent discussions on subjects, illustrated the value of the methods and the possibilities of deaf mute instruction, and contributed no little to the meetings. Indeed, some of their papers could hardly be improved on by those possessed of all the senses, and cultured under the educational advantages of the age.

In connection with the convention was a normal department in which great interest centered.

Perhaps the most noteworthy feature of the convention was the organization of the oral teachers into a separate section for the consideration of subjects pertaining to them. They also took steps to incorporate an association for the promotion of oral teaching. To this proposed corporation Dr. A. Graham Bell made a gift of $25,000. One of the plans in view is the holding of a summer school for teachers. This is a step that ought to be taken by all teachers of the deaf where it is possible, as no better way could be conceived of spending part of the vacation than in meeting for the better preparation for this work.

It was decided to hold the next convention during the world's fair at or near Chicago. S. H. L.

Chemistry teaches us the important arts of close and accurate observation, and of drawing correct inferences from the facts recognized. If we regard education as intellectual discipline rather than the mere absorption of a number of facts, we shall find some one of the branches of natural and physical science absolutely essential and indispensable. And under most circumstances chemistry will prove the most appropriate subject.

For the Review.]

Meteoric.

Having noticed a correspondence in the Educational Review concerning observation of a meteor, or what appeared at first as a shooting-star, on the evening of August 6th, I thought I would give a description of what I observed on that evening just after sunset; and allowing a few minutes for the difference of longitude, I think it must have been the same object observed at the same time.

As viewed from here it was about east and I think about 40 degrees from the horizon. It appeared to shoot upwards; the streak of light (to speak without regarding distance) about 20 feet in length, it remained longer than I had ever observed any before. It then appeared to widen out as the object described by your correspondent, becoming first crooked at the upper portion then nearly all of its length; and from different portions of its length appeared to send forth streams of vapor, the whole in a few minutes forming into a cloud; it floated slowly towards the northeast. I observed for the space of half an hour or until with distance and darkness it could not be seen. I conjectured if it had been a meteor it may have shot downwards, and the gas into which it dissolved by friction did not at first ignite as it rushed through a body of vapor and generating electricity was instantly lighted from the lower end, the electric shock condensing the surrounding vapor into a cloud — as there was no cloud to be seen in that direction at the time of the flash of light, the meteor appearing to show in a clear blue sky.

Its motion towards the northeast or rather the cloud form in the upper strata of vapor moving in that direction caused me to think that probably this was one of the many phenomena often occurring in the upper stratas of our vapory atmosphere but seldom witnessed.

The above remarks I give on account of the different positions viewed from, should it have been the same object would interest some as regards the distance from the earth at time of occurrence.

G. Parker.

Parker's Ridge, York County, N. B.

Commendation.

Never forget to commend a good recitation. Should a pupil fail to come up to the standard, to merit unqualified commendations, give him such encouragement as you can consistently. Pass an opinion upon his effort anyway, and let him know that you are thoroughly cognizant of where he stands. It may be necessary sometimes to tell him that he has succeeded admirably in one part of his lesson and failed entirely in another. It helps wonderfully for a pupil to know that earnest labor will be appreciated by his teacher.

A prominent lady teacher, in writing on the subject for an educational journal, some time ago, expressed herself as follows: "There is no influence emanating from a teacher, during recitation, which so completely paralyzes the mind of the pupil as the practice of scolding or ceaseless fault-finding, once so prevalent, but now rapidly disappearing from the public schools. The temptations to petulance and snappishness on the part of teachers are manifold and at times almost irresistible. Lack of faithful preparation, of quickness of perception, of moderate reasoning power, of interest, of enthusiasm, of uninterrupted attention, of just appreciation of the object and advantages of recitations, are causes of irritation to be found in almost all classes. Those who possess but little love of the work of education, who regard neither the present happiness of children nor the future welfare of individuals and States, who, in short, work in the educational vineyard exclusively for dollars and cents, or because more congenial fields of labor are not immediately accessible to them, are peculiarly liable to infuse this kind of narcotic influence into all the intellectual exercises of the school.

"Don't" is more often heard in some schools than in others. "Don't whisper so much," "Don't make a noise with your pen," "Don't study out loud," etc., is the burden of the teacher's talk. In our schools there is much cheerful talk, much encouragement. We hear the teacher say, "John read that charmingly — loud and clear, and without a single stumble." "See how quietly May has been sitting; you would not know she was here." "Did you notice how carefully James came in? He shut the door so carefully that no one was disturbed." Fault-finding is not pleasing to the pupils — they get so used to it that they shut their ears to it. The teacher thinks it strange that they don't mind his "don'ts;" he is sure he puts in enough of them.

Directions for Making a Large Putty Map.

1. Make, or have made, of half-inch board, a wooden molding board, two feet by three feet. Paint it on both sides a light blue, two coats.

2. When dry, mark out with colored crayon or pencil the line of the continent to be made.

3. Then spread over the surface of the grand division a thin layer of putty, using the hands, putty knife and a small roller. Cut out the coast line distinctly.

4. The next day additional putty can be added to indicate the elevation, table land, etc. The long

strips of putty are put on to mark out the different prominent chains of mountains, and a cone of putty half an inch high placed in its position to illustrate the highest mountains. The mountains can be made rough with a sharp pin.

5. Now mark the courses of the rivers from mountain source to mouth with an awl, and fill the little channel with tinsel thread such as ladies use for ornamental work. The lakes and inland seas can be covered with tin foil. When the putty finally hardens, these will be held in place. Different colored putties may be used to represent elevations, as on Guyot's physical maps. Red putty is considered a good color when only one color is used.

If the putty is in proper condition for setting panes of glass, it can be easily manipulated for the raised map; it does not crumble or crack, and does not need to be painted. We have a full set of these maps made by a pupil fourteen years of age. They have proved to be most valuable for teaching elevation and drainage. Each one costs about $1.25.

The pupils may be encouraged to make small putty maps after the sand map has been introduced. They will enjoy the experiment, and some with a little help will succeed remarkably well.

Raised globes are used to a considerable extent in Germany, but they are at present too costly to be used in this country. Such raised globes could be easily and cheaply made by putting putty on a paper globe.—*King's Methods and Aids in Geography.*

The School Teacher in Germany.

"Teaching in Prussia is a profession, as law, medicine and theology are in America.

"The teacher receives a definite professional course of study, he has definite purposes and aims in his work, and, therefore, definite knowledge of the means to be employed by which these ends are secured. He has studied the child physically, intellectually and morally; he has studied pedagogics or the history of education; he has studied didatics, or the application of these principles to teaching; and he has taught and thus put his knowledge into actual practice. It is not surprising then that there are so many good teachers, and there is no blind guessing in the school room. The above facts account in a great measure for the general good health of the teachers and the absence of nervous worry. Where the face of the teacher usually has wrinkles, the Prussian teacher has dimples. The absence of friction and worry is quite noticeable in the school. The teachers appear to direct, and the pupils work and notice results. As already observed text books are small and but little used; threadbare explanations are worthless, verbalism discountenanced, the child is directed to observe, to work, and then to express the results orally and on paper. The teacher believes that by simply telling or reading, there is only a communication of signs to the pupil. As the wires convey signs, signs at one end, signs at the other, but they are only signs, the benefit derived from these signs depends upon the child's ability to properly interpret them. The voice, the eye, the manner of the teacher may rouse the child, may direct him, but it gives him absolutely nothing."

During the first school years much of the history, geography and knowledge of nature is learned in the fields. The children are taken to the field to observe and study the physical features of the country, plants, animals and minerals as they are, and then they describe what they have seen, orally and on paper.

The use of dead specimens, drawings and explanations are employed to correct, complete, fix or extend this information. In addition to this local study the teachers and pupils take journeys, which may continue a day, or even a week. On these occasions the plan is carefully sketched before they start. Everything of interest is carefully examined, and the impression noted in a book. The children make collections, sing national songs, march, act, speak and think naturally in presence of the teachers.—*Notes on German Schools.*—Dr. Hall.

[Our readers will observe that our summer science schools are really an outcome here of the principles which have more profoundly and universally affected the German system of teaching. Reason here as well as in Germany points out the same general road; but the Germans evidently took the road long before us, and are now quite a distance ahead.—Editor.]

The Personality of the Teacher.

No fact has been more conspicuous in every reform than that the reformers placed their work far above themselves, and were willing to make any personal sacrifice for its success. Just as in battle soldiers are led to victory by their captains, but not driven, so in social life the vicious and ignorant can only be induced to seek higher life by those who show a direct personal interest in their welfare. The life of the leader is of far more importance than his doctrine. Many a minister of the gospel who could hardly preach a passable sermon has done incalculable good to his fellow-men by his walk and conversation, and self-denying zeal in their behalf. So, many a teacher whose intellectual qualification and endowments were of the slenderest kind has proven a greater blessing to his pupils than another much more richly gifted but selfish, by his evident devotion to the good of his pupils. It is a trite but true maxim that actions speak louder than words. It is not enough that the teacher take a mere scientific interest in those who come under his or her instruction. This is all very well; but there must be superadded to this a moral interest. This will make its influence felt in the life when much that is intellectually comprehended will be forgotten. Protestant parents are frequently warned by their better informed co-religionists against placing their children, especially their daughters, in Roman Catholic boarding schools, because of the imminent danger of their conversion to the obnoxious faith. Yet there is reason to believe that no direct efforts at proselyting are made under such circumstances. It is more probable that the kindly attitude towards, and the affectionate interest of the Sisters in, their pupils are what lead to a change of creed, for it is natural to assume that the creed of the teachers regulates their life and inspires their motives. In like manner the instructor whose teaching is only "for what there is in it" will never inspire pupils with a genuine and lasting love of learning.—*Journal of Pedagogy.*

Requisites of a Real Education.

In an address before the Teachers' Association of the McGill Normal School, Montreal, Prof. Wesley Mills, explaining his educational creed, assumed that the need of knowledge, or realization, is infinitely greater than the needs of expression, as witness the whole creation below man. An individual may be educated, though unable to read a sentence, write a line, or add up a column of figures. As a matter of fact, many men have become eminent among their fellows who could not do any of those things. Why has this been so? The reason is plain. These men understood the forces of nature, though they could not in all cases have stated their knowledge in our conventional forms of expression. The art and science of expression should be taught in schools, but should be subordinated to the acquisition of knowledge of things. The moral and social nature of man should receive greater attention. The teaching of religious doctrines and the observance of religious forms are not practical in the public schools, but ethics by precept and example should be prominent from the day that a child enters the school. A reverence for all kinds of truth should ever be impressed. Only one system of education — the Kindergarten — has ever met the nature of the child even fairly. The laboratory of the college is only the modified Kindergarten. Why is not the public school teaching more like one of these? Because we have mistaken forms for knowledge and words for things, to a lamentable extent. "As our schools are now constituted, I must deliberately declare it as my conviction that they tend rather to quench than to excite a love for nature and real knowledge of things, and to disgust young minds thirsting for a contact with realities. . . . I have known children that did not go to school till seven years of age, who had prior to that learned to be good observers of what was going on around them, lose all love for natural objects after being at school a couple of years; and I do also know to my sorrow that many of the young men that enter our colleges neither know how nor care to observe. They prefer not to look nature directly in the face, but try to see her through the medium of books, lectures, etc., and for this our school system is largely responsible." One of the remedies proposed for this evil is the simplification of the too ambitious school programmes. Abstract subjects, like history and grammar, should be left for future years. They take up the time that might be devoted to developing the intelligence through cultivation of observation and stirring the mind with the results of the exercise of the senses. Childhood is not the period of life for developing abstract notions, but for acquiring concrete ones. While in the abstract it is true that a knowledge of French, Latin, Greek, etc., may help to make one a better English scholar, the idea that an amount of these languages that would be of any value can be taught to the average pupil, without the neglect of other important work, is a delusion. The school should aim to enable the child to speak and write its mother tongue readily, clearly and elegantly. This will not be accomplished by teaching English grammar or foreign languages, but by contact with good models and practice. "Time is now frittered away on so many subjects that nothing is well done, and with the most disastrous effects on the habits of the learner. Our schools are dreadfully bookish."

Order.

1. The teacher's desk should be an object lesson in order and neatness. It should not be a receptacle for bits of strings, marbles, waste paper, broken pencils, etc.

2. All places for storage of copy-books, etc., should be as neatly arranged as the desk.

3. The floor should be as free from unnecessary dirt at 3:30 P.M. as at 9 A.M. The floor is not to be used as a waste basket.

4. Teach the pupil how to avoid dropping ink upon floor or desks. Have all ink-spots removed daily. Do not allow them to accumulate.

5. Inspect all furniture often (daily inspection is best); notice all scratches, ink-stains, or other marks. Call the pupil to account for each injury.

6. Return crayon, as it is used, to the box; do not leave it about the room to be crumpled upon the floor, or to be slipped into a boy's pocket for the marking of fences and walls.

7. Give some care to the execution of temporary blackboard work, even though it must be hastily done. Erase such work at the close of each session. Let all work which is to remain for several days be executed in the best possible manner. These things teach much and in a forcible way.

8. Both window curtains of a pair should be uniform in position at all times. A curtain askew is not an aid to the child's education.

9. Let whatever of pictures, paints, or other ornament the room may contain, be neat and tasteful, however inexpensive.

10. The pupil's desk should contain no article not used in his work (*i.e.*, in first or second grade, lead pencils, paper, erasers, etc., are forbidden articles, since the slate only is in general use, and all pencils are kept by the teacher.

11. The pupils of the same class should be taught to arrange their books in a neat and uniform manner. Teachers should notice, often, that this is done. The pupil's desk should never be "out of order."

12. Do not allow the pupils to lay wet sponges upon the desk at any time. The place for the sponge is in the iron frame-work, during the session, and inside the desk at night.

13. See that pupils do not accumulate a quantity of waste paper in desk or books. Papers of problems, etc., to be destroyed directly after use.— *Colorado School Journal.*

Dalhousie University has opened with the largest attendance yet. The law-school students have held their first mock parliament already. The arts' students have organized their various societies. The successful candidates at the Munro competitions are as follows: *Senior exhibitions*, $300 each. 1, Bakin, 2, Webster, 3, Johnston, G. F., 4, Robertson. *Senior Bursaries*, $200 each. 1, Hill, 2, Johnson, J. B., 3, Weston, 4, Miss Archibald, 5. McNeill, 6, McIntosh, D. S., 7. MacDonald, 8, MacIntosh, J. A., *Junior Exhibitions*, $300 each. 1, Brehant, P.E.I., 2, Fraser, Pictou, 3, Gordon, Halifax, 4, Miss Ross, P. E. I., 5, Gray, Pictou. *Junior Bursaries*, $200 each. 1, McKay, Pictou, 2, Ross, P. E I., 3, Miss McKenzie, Pictou, 4, Miss McPhee, Pictou, 5, Grant, Pictou, 6, Archibald, Truro, 7, Miss McDonald, Pictou, 8, Johnson, Pictou, 9, Simpson, Halifax, 10, Bigelow, Truro. In all $6,300 (six thousand three hundred dollars).

BOOK REVIEWS.

THE HISTORY AND STORY OF KING'S COLLEGE, OR THE UNIVERSITY OF KING'S COLLEGE, 1790-1890, by Henry Youle Hind, M. A. Pp. 119, 6 by 9 inches; cloth, $1 50. Proceeds for the benefit of the College. New York: The Church Review Co. Halifax: T. C. Allen & Co , 124 & 126 Granville street This is got up in good typographical form, and contains many interesting historical facts selected for the purpose by the clever author, Henry Youle Hind. It will be a valuable monument to the virtues and graces of a collegiate institution which, in the pioneer age, existed for several years without a successful rival. Those were the days when the rivalry of educational institutions not under the wing of *the* Church were sternly discountenanced; when the Pictou Academy was doing the work but could not confer the degrees. King's College, on the other hand, degenerated in the amount of work, but reached a maximum of degree conferring performances with the close of its century and of the volume. While this volume professes to be historical, it must be remembered that it is historical with a purpose. Witness the state of mind of the author in nearly his closing words: "It closes the hundredth year of its existence with six professors, three lecturers and one tutor." [Number of students not mentioned] "Throughout this period, sometimes peaceful, sometimes stormy, always, until late years, uncertain, it has ever remained true to the Church, and resisted all blandishments, threats, and commands directed towards alienation. *In hoc signo vinco.* It has gradually been united in closer bonds with the representatives of the Church through the Synods of the two Dioceses it now serves; and so intimate is this relationship that in an appeal bearing the signatures of the Right Reverend the Lord Bishop of Nova Scotia, and the Most Reverend the Metropolitan of Canada, dated July, 1889, the whole matter was summed up in the following unequivocal words: 'All who love their CHURCH and their COUNTRY must, if they will but consider for a moment, recognize the fact that the BEST INTERESTS OF BOTH IN THE FUTURE ARE BOUND UP WITH THE MAINTENANCE IN FULL EFFICIENCY OF KING'S COLLEGE.'" Those who would amend this eloquent conclusion by realistically reading "Windsor" for the words "their COUNTRY" would sweep away at one breath much of the inimitable power of this masterly comic touch, as the curtain falls.

FIRST YEAR IN ENGLISH GRAMMAR, by Jessie McM. Anderson, teacher of English and Latin at the Cedars, Washington, D. C. Publisher, John B Alden, New York. This is an attempt to teach English Grammar scientifically. Children are first taught to observe, then to express the result of their observation in words, and gradually to consider these words as parts of speech and combine them in sentences

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SELECTIONS FROM HEINE'S POEMS, edited with notes, by Prof. Horatio Stevens White, Cornell University. Publishers, D. C. Heath & Co., Boston. Mailing price, 80 cents. The selections contained in this neat volume embrace a great variety, and illustrate the peculiar powers of the great German poet and his masterly style.

Elements of the Differential and Integral Calculus. Method of Rates by Arthur Sherburne Hardy, Ph. D., Professor of Mathematics in Dartmouth College, pp. ix. + 239, 8 inches by 6, cloth, $1 65 Boston, U S. A, Ginn & Co., 1890. We have seen no treatise on this subject which puts the elements of the calculus in a more simple and elegant manner. The typographical character of the book admits of no superior among modern text books

The Directional Calculus, based upon the methods of Hermann Grossmann, by E. W. Hyde, Professor of Mathematics in the University of Cincinnati, Ohio, pp xii. + 247, 8 inches by 6, cloth, $2.15. Boston, U. S. A., Ginn & Co., 1890. What is true of the typographical style and finish of the above mentioned volume is also true of this. This is a novel treatment of that new algebraic system invented by Hamilton, and generally known as Quaternions. Grosmann's method has great generality, all results being obtained for *n*-dimensional space. In this volume the discussion is confined to space of two and three dimensions, and, therefore, deals with ordinary geometrical dimensions. It is probably the most popular possible presentation of this mathematical branch yet published.

Home Exercise for Health and Cure, with 45 illustrations, translated from the German of D. G R. Schreber, M. D, (23rd edition), by Charles Russell Bardeen, pp. vii + 91, 6½ by 4½ inches; cloth. Syracuse, N. Y.: C W. Bardeen, publisher, 1890. The object of this work is stated to be "to furnish physicians, patients, parents, educators, and weak persons of every condition of life with a costless, easily understood and perfectly practical system of individualized bodily exercise for the cure of many diseases, for strengthening and developing the body; for preserving health and vigor till ripe old age; in short to bring to the notice of everyone a means of health within himself." It is certainly a most practical little book, more than usually interesting on account of the exact physiological effects described as the object of each kind of exercise.

A Pocket Hand-Book of Biography, containing more than ten thousand names of celebrities in every sphere of human action, showing their nationalty, rank or condition, profession or occupation, the dates of their birth or death, etc. Compiled by Henry Frederic Reddall. Pp. 263; 4 by 6 inches; cloth. Syracuse, N. Y.: C. W Bardeen, 1890. Generally one line to each name, ending with dates of birth and death, forming a double column of dates on the right margin of the page. A *multum in parvo.*

The Annals of Tacitus, I.–VI., by the late W. F. Allen, Professor of history in the University of Wisconsin. Mailing price, $1.65. Publishers: Ginn & Co, Boston. This volume is the latest in the College series of Latin authors published in such excellent form by Messss Ginn & Co. In the volume before us are presented the first six books of the Annals of Tacitus. The Annals are regarded as the masterpiece of the writings of Tacitus. The ample introduction presents a life of Tacitus, an estimate of his language and style, a discussion of the characters treated in the Annals, and the constitution of the Roman empire at the time Tacitus wrote; and the excellent notes condense the rich stores of illustrative material derived from a long and concentrated study of Tacitus by modern scholars.

Recollections of Gen. Grant is a neat little brochure of 100 pages, by G. W. Childs, editor of the *Public Ledger*, Philadelphia.

Primer of Book-keeping, by J. Thornton London: MacMillan & Co.; and New York. This is an exceedingly simple and excellent introduction to book-keeping, with the object of assisting and encouraging the intelligent study of its principles in schools and families.

Bunyan's Pilgrim's Progress. One of the series of Classics for children. An excellent abridgment by Montgomery of Parts I. and III. Board, 7 in. by 5 in, pp vii. + 119, good print, 35 cents. Ginn & Co., Boston, U.S A., 1890.

A First Reader. One of the series, Stepping stones to Reading, by Anna B. Badlam, Principal of Training School, Lewiston, Maine. Makes use of phonic aids and illustrations, with script exercises. Board 7 in. by 5 in, pp. xiii + 159, beautiful print, 35 cents. D. C. Heath & Co., Boston, U. S. A., 1889.

Plane and Solid Geometry, with numerous exercises, by Edward A. Bowser, LL.D., Professor of Mathematics and Engineering in Rutgers' College. A capital book, in line with modern improvement. Contents: pp. 1–13, Introduction. Book I., Rectilinear figures, 54 pp. Book II, The circle, 62 pp. III., Ratio and proportion, similar figures, 49 pp. IV., Areas of polygons, 28 pp V., Regular polygons; The circle; Maxima and Minima; 42 pp. VI., Plane and solid angles, 37 pp. VII, Polyhedrons, 53 pp. VIII., The sphere, 30 pp. IX, The three round bodies, 25 pp. Each of these books is subdivided with admirable analysis and order. The demonstrations are expressed in extremely concise form, and a great number of exercises are given on each subject. We would estimate that the same mathematical knowledge and power might be acquired from this book in at least two-thirds of the time it would require from Euclid's classical text. Cloth, 7 in by 5 in, pp. vii. + 393, good paper and print. D. VanNostrand Company, 23 Murray and 27 Warren streets, New York, 1890.

Abeille *par Anatole France*, edited by Chas. P. LeBon, Boston. D. C. Heath & Co, publishers. This is a series of delightfully told stories, suitable for French learners, but the maturer students of French will find the humor contagious and the style pleasing and simple.

A Practical Delsarte Primer C. W. Bardeen, publisher, Syracuse, N Y. This is a compendium stating briefly the principles of the Delsarte system of elocution, and may be used as a manual and drill book by students.

Sidney's Defense of Poesy, edited, with introduction and notes, by Professor Albert S Cook, of Yale University. Published by Ginn & Co., Boston. Students of English will welcome this admirable essay, which for pure and simple style, eloquence and aptness of illustration has no superior in English literature. In the bright, fresh pages before us, accompanied with the useful notes of the editor, there is a greater inducement than ever to read this masterpiece.

SOUTHEY'S LIFE OF NELSON, edited, with introduction and notes, by Michael MacMillan, B. A (Oxon), Professor at Elpinstone College, Bombay. London: MacMillan & Co, and New York. This is one of the most stirring biographical sketches in the English language. The admirable manner in which it has been edited, with its clear explanations, its plans showing the position of the opposing fleets at the battles of the Nile, Copenhagen, Trafalgar (which could be easily reproduced on the blackboard), would make this an adjunct, in the hands of the teacher, to give a new life to the history lesson, especially as a Friday afternoon exercise.

BOOKS RECEIVED.

TEXT BOOK ON GEOLOGY; GEOGRAPHY OF INDIA: Publishers, MacMillan & Co, London and New York.

FRENCH GRAMMAR: D C. Heath & Co., Boston, publishers.

HAND-BOOK OF LATIN WRITING; SYNOPSIS OF ENGLISH AND AMERICAN LITERATURE: Ginn & Co., Boston, publishers.

PROGRESSIVE FRENCH READER: Drysdale & Co., Montreal.

SIXPENNY ATLAS: W. & O K Johnston, Edinburgh and London.

POST'S VOLAPUK GRAMMAR: Mattapan, Mass.

KING'S COLLEGE CALENDAR.

Exchanges.

The *American Geologist* of September among other interesting articles has one by George M. Dawson, Assistant Director Geological Survey of Canada, on "glaciation of the northern part of the Cordillera, with an attempt to correlate the events of the glacial period in the Cordillera and great plains" It is of special interest to Canadians.... The *American Naturalist* of August has the very interesting article on "History of Garden Vegetables," continued, and a good review of "Geddes and Thompson on Evolution of Sex.".... The *Microscope* has had some interesting articles on fresh water sponges by E Potts, Esq., of Philadelphia

Special Notice.

We are thoroughly revising our subscription list, and with a view that no subscriber's name may be left off the new list, we send a memorandum to each one in arrears, stating the amount of indebtedness due June 1891. We have fixed this date in order that subscriptions may begin with the new year in June. Those who have not received bills will remember that payment to the REVIEW is made in advance. This is satisfactory, both to subscriber and publisher. Our bills for publishing the REVIEW are heavy. They are met promptly, and our subscribers can enable us to do this in future, as in the past, by remitting promptly. Please answer this notice, and if unable to remit immediately, send a postal card stating when the amount will be sent, in order that your name may be continued as a subscriber.

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The Calendar for the Session of 1890 91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 15th. 1890).

DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).

FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.

FACULTY OF MEDICINE—(Oct. 1st).

FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).

FACULTY OF LAW—(Oct. 1st)

McGILL NORMAL SCHOOL—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.) J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

WE give up a large portion of space in this issue to reports of teachers' conventions. Although the merest outline of the proceedings is given in each case, this will, at least, preserve a record of these meetings that will be of some value in our educational history. The readers of the REVIEW will be interested in comparing the plans of work in the different institutes. In some, papers and discussions filled the programme, in others a variety as well as a practical turn was given by teachers instructing classes before the institute. This is an admirable plan, and we hope to see it more generally carried out in the local convention. At the Provincial convention, in educational works, in school journals, the teacher comes in contact with enough of theory. Just how to present a subject and come in touch with a class is what is of value to hundreds of teachers. A lesson to a class by one who has been successful in a certain subject will quicken the educational pulse far more than the most carefully prepared paper, and give to many a teacher practical hints which could be obtained in no other way.

HIS Excellency, Lord Stanley of Preston, Governor-General of Canada, has, with praiseworthy energy and most admirable endurance, paid much attention to educational matters in his visits. In Halifax, for instance, he visited the University of Dalhousie, the Convent School of the Sacred Heart, the Halifax Ladies' College, St. Patrick's High School, and the Halifax County Academy. At the latter institution he gave a very able address, worthy of any professional educationist, which, while directed to the students, was, of course, in many points meant for instructors and the public moulders of our system as well.

A NOTABLE MEETING.

The annual convention of the College Association of the Middle States and Maryland, held at the close of last year, was in many respects a notable meeting. From the volume of proceedings before us, we notice that forty-six presidents and professors, representing twenty-three colleges and universities, assembled to read papers and exchange views on some of the problems which are most urgently demanding solution in the educational world.

Of these subjects the papers on technical education are characterized by wisdom and moderation—particularly that of President Adams of Cornell. No one has had better opportunities of studying the working of a technical college as a department of a great university than he has had in the Sibley College, at Cornell University; and he expresses the view that it is an unmistakeable advantage for technical studies to be prosecuted in touch with those of the other faculties—that there is produced "a certain cosmopolitanism which cannot be found in an institution when they are isolated from all others." And emphasising his objection to narrow specialization he continues to say: "While it ever remains true that the professional man must learn his profession thoroughly, it is equally true that he will not practise his profession with the greatest success unless he knows also a great many other things. He must know human nature; he must know what is going on in other fields of learning; he must have that breadth of view, that spirit which I have called cosmopolitanism in education, which will take away from him that arrogance that is apt to result from too narrow a specialization." President Sharpless of Hansford College, while advocating co-operation between the smaller colleges and properly equipped technical schools, enters an indignant protest against the action of those who would degrade the course of study to meet the demand for what is called a practical education. He says "It will be a sad day for America if utilitarianism usurps more than its proper place. The proper balance of ideas demands that the exponents of pure scholarship should not abate one iota of their claims. The colleges are their special working grounds and they must not surrender them unduly to intruders. While recognizing that a scientific course may produce a valuable culture, they must make good their title to being the real educators of the American people, and force an acknowledgement of the fact that for all men, whether working for material or intellectual results, their courses are an invaluable preparation." The drift of opinion tended to the advisability of making technical teaching a university rather than a college work, and of insisting on a large measure of culture study in connection with the technical courses.

The proposal to examine candidates for admission to the university in one or two English classics is one in which, if we mistake not, many advanced teachers in these provinces will heartily sympathise. The work which is set down for a high school department is largely determined by the requirements of the college matriculation examination. But the great majority of those who enter the high school complete their studies there, and must, therefore, enter upon the duties of life with such preparation as it provides. We cannot, however, accept as an adequate outfit in English, such a knowledge of grammar, including parsing and analysis, and such very elementary composition as is often required of matriculants to college. A higher standard of excellence in English composition ought to be fixed, and certain books selected from English classical authors, in the same way as we choose books from the Latin and Greek classics, should be prescribed for thorough study and careful examination, and manifestly the energies of the pupils would not be overtaxed if to this we were to add an elementary acquaintance with English literary history of the last three centuries. Were this done pupils would leave school more rationally trained than they are at present, somewhat cultured as to literary taste, and with the desire to read for themselves evoked and stimulated. And we feel assured that professors of English in our colleges would be delighted to escape the elementary work which must at present be the occupation of the first year's students in English, and devote the time thus rescued to pursuits more congenial to themselves, and more inspiring to those who are committed to their care.

THE FAILURE OF EDUCATION.

Under this heading we find a tart article by LeSuer in the Toronto *Week*. "How empty of all results a five or six years' course of schooling may be, hundreds of parents are daily forced to acknowledge. The conclusion that we draw is that in general the physical trainer knows what he is about while the intellectual trainer does not." This is the burden of his wail. And too much truth there is in it. But there are other parents, and other children, and other teachers.

Again :

> "State education is and always will be book-education, if only on account of the uniformity that must necessarily characterize it. What is wanted at the head of an educational establishment is a strong and an original personality; when you have that you must allow it scope — more scope than it can ever have under the regulations of any department of education. A really rational system of education, moreover, would necessarily be much in advance of average opinion, and could not, therefore, be administered by the state, which in all things can only go as far as average public opinion permits "

But what if at the head of an educational department there is a strong and original personality? Would not that be as good for the state system as it would be for the private school? And would the results be considerably more extensive in their development?

He strikes the nail on the head, among his random blows, in the following paragraph:

> "Every teacher in the land who divorces words from realities and thoughts from things, who puts meaningless or evasive reasons into the mouths of pupils, who fills the mind with abstractions before the perceptive and apprehensive faculties have had any proper exercise. Every teacher, we might almost say, who follows the ordinary method of the schools is inducing stupidity, more or less, in the minds of his or her pupils. The worse than nullity of the intellectual discipline in such cases is masked by the fact that a certain amount of positive knowledge has been communicated; and parents, who unfortunately judge of schooling by what their children seem to have learnt in certain recognized 'branches of study,' are sometimes satisfied though more often not. 'My child seems to be learning absolutely nothing at school!' is an exclamation not unfrequently heard. We should not advise the parents of such children to despair, however. Barring cases of vicious obstinacy, the child who seems to be learning nothing at school may, perhaps, be keeping his faculties unimpaired for future use; while the boy who is the teacher's pride may be surrendering up his own individuality, in a most hurtful degree, to the will of another, and taking an impress of artificiality and intellectual dependence that he will not free himself from for the remainder of his days. Not often is the winner of many prizes at school the winner of the great prizes of active life."

IS NOT SOME IMPROVEMENT POSSIBLE?

The late education act, fixing the sum total of the government grant to Nova Scotia teachers, was so crudely called into existence, as to cause a great deal more mischief than what our teachers generally complain of. As the sum total of the grant has to be divided to each teacher in proportion to his grade of license, and the number of days taught, every teacher must remain without his money until all the school sections in the province send in their returns. The whole province must wait on the most backward county, which in turn must wait for its most backward sections. Then follows a tremendous operation of figures by which the sum total is torn into some two thousand irregular fragments; and the inspector who should be attending to his duties as an inspector, is basely turned into a sort of Babbage's calculating machine. The teacher, besides having his grant reduced, must lose a month's interest on a large portion of his salary twice a year. The schools must go without inspection, and the inspectors must pass through a non-purgatorial torment, which, while it pains much, purifies them not and saves not an iota of anything imaginable for the use of the country. Why cannot a certain amount for each grade be fixed each year in advance, based on the results of a previous year? If $60 cannot be given to a B teacher per term, make it $59 or $58, or any other round number which will probably fall within the estimates, or revise the figures every four or five years. A teacher could then calculate exactly what salary he is going to work for; and the difficulties referred to might, in a great measure, thereby be obviated.

There are other practicable changes possible, we think, which would reduce the amount of invaluable and necessary time taken from inspectoral duties, changes which would result in gain in several respects, and loss in none. Say for instance, the centralizing of the functions of paymaster. A cheque can travel as safely from Halifax, and as rapidly nearly, to the uttermost border section, as if it started from a county town. We offer the suggestion. Some of our readers can judge better, we have no doubt, of the advantages of the proposed modifications. The simpler the machinery, the more completely is the power transferred, and the less is the cost of wear and tear and friction.

THE free scholarships offered the Halifax Academy by the Victoria School of Art and Design, were awarded, after very close competition, to the Misses Moody, Belcher and Fairbanks.

Teachers' Associations.

ANTIGONISH AND GUYSBORO COUNTIES, N. S.

The teachers' association, for this inspectoral district, met, according to an excellent programme previously published, in the fine convocation hall of St. Francis Xavier College, on Tuesday and Wednesday, October 9th and 10th. Ninety-six members were enrolled, which shows an educational enthusiasm in this district inferior to none in our provinces. It was resolved that the association should meet annually. Rev. Dr. McNeil, President of St. Francis Xavier College, gave an able opening address on "The Art of Teaching." Joseph A. Wall, of Guysboro Academy, gave a practical illustrative lesson in language, a department in which he specially excels, to a class drawn from the schools of Antigonish. D. C. Gillis followed, with a lesson on grammar, to a more advanced class. Miss Aggie H. Hamilton led on the second day, with a paper on reading, followed by a lesson, selecting a passage from Whittier. Charles F. Hall, Principal of the Canso schools, gave a clever address on "The Teacher at Home," that is, in his school-room. In the afternoon, Miss Mary A. Hamilton, the brilliant instructor in charge of the Dartmouth Public School Kindergarten, gave a sketch of the life of Froebel, and a charming practical lesson, with the "gifts," "occupations," and songs, all brought into play, with an infantile Antigonish class. A very important lesson was finally given in elementary arithmetic, by Mr. Martin McArt. He very aptly illustrated methods of inducing young pupils to put their mathematical knowledge into practical work, which at the same time gave a stimulus to the development of mathematical power in the abstract.

Several important matters of local and of general interest were discussed. We can only refer to a unanimous resolution, after discussion, passed in favor of having the school year consist of one term, instead of two, as at present. We are glad to see the east so clearly decisive on this question, and, if we mistake not, District No. 6 has taken the lead. We are sorry space compels our account to be so brief. The points we have noted, however, will become a part of our provincial history, by having them collected in our columns. The officers elected are as follows: President, Inspector A. G. MacDonald, M.A.; Vice-president, the Principal of Main Street school, Antigonish; Secretary, Martin McArt, of Havre au Bouche, to form an executive committee with Principal Longley, of Guysboro Academy, Principal Hall, of Canso, Principal W. A. Chisholm, of St. Ninian Street school, Antigonish, and the Principal of Sherbrooke school.

The most successful institute ever held in this section of the province, was then duly and appropriately closed, with "God Save the Queen."

District X., Nova Scotia.

The teachers of District No. 10 met in the high school room at Pugwash, on Tuesday, October 28th. About eighty were enrolled; after which followed an address to the teachers by Inspector Lay, on "The Practical Work of the School-room." In the afternoon a lesson was taught by D. A. Ross, of the Amherst Academy, on physiology. Then followed a lesson on calisthenics, by Miss B. McKay, of Brule, and a paper on "Practical Aid to the Purpose, on the Duties of the Teacher," by Principal Calkin. In the evening a large meeting was held in the Methodist church, at which music by the choir and band was rendered; an address of welcome from Dr. Mackintosh, and speeches by the chairman, Councillor Wilson, Revs. McKenzie and Giles, Principal Calkin, and Inspector Lay. The chairman, on opening the meeting, read the following telegram:

Pugwash, Oct 28, 1890.

Sir Charles Tupper, London;

First passenger train arrived here to-day, carrying teachers' convention, a coincidence that happily crowns your work for free schools and railways in your native province.

(Signed) A. Wilson.

London, via St. John, N. B.,
October 29, 1890.

A. Wilson:

Thanks. Delighted to learn line open and so fittingly inaugurated. Wish Pugwash every prosperity.

(Signed) Chas. Tupper.

Great cheering followed the reading of the telegrams. A pleasing incident was a resolution of regret by the teachers at the withdrawal of Messrs. Slade, Byers, and Johnson, from the teaching profession.

Other papers were read by Miss Cameron, of Parrsboro, on "Morals in our Public Schools"; by Miss McDonald, of Amherst, on "Kindergarten work, and the materials that may be used in our Public Schools"; and an interesting lesson on decimals was given by Inspector Lay.

Carleton County, N. B.

The Carleton County, N. B., teachers' institute was convened at Woodstock, October 16th. There were sixty-eight teachers present. It was one of the most interesting and profitable institutes ever held in the county. A very full programme was carried out. The public meeting, on the evening of the 16th, was well attended, and much interest was manifested. The following is the programme of the various sessions: First session—Routine business; address by President, R. P. Steeves, M. A.; address by Inspector Bridges, M. A. Second session—Paper, "Res Scholasticæ," by J. Howe, M. A., followed by Principal Steeves, who reviewed the paper at considerable length. Third session—Public meeting, addressed by L. P. Fisher, Esq., chairman of Woodstock School Board, and by Rev. Wm. Dobson. The first speaker made a strong argument in favor of compulsory education. Fourth session—Paper, "Value of Experiments," by Miss Sarah Sharp, of Woodstock, followed by an experimental lesson by Mr. McLean; Paper entitled "Home Lessons," by Mr. Benn, followed by a discussion. Fifth session—Paper on reading, by Miss Wheeler, followed by discussion. The following officers were elected for the ensuing year: President, Mr. A. Plummer; Vice-president, Miss Wheeler; Secretary-Treasurer, Mr. Farley; Committee of Management, Miss Sharp and Miss Good.

Northumberland County, N. B.

The fourteenth session of this institute was held at Chatham, October 16th and 17th; sixty-six teachers were present. The following papers were read: by Miss Ullock, on teaching composition; by Miss Miller, on science teaching; by Miss A. G. McIntosh, on reading; Mr. F. P. Yorston, on derivation; Mr. J. F. Oneus, on the teaching of geometry to beginners; Mr. Cox, on the development of character. Misses Creighton and Ullock read extracts from The Educational Review on Kindergarten work; and Miss Thompson stated the aims of the Kindergarten. The child is to be trained early for his later study and life. The eye and hand chiefly are trained, the inventive and imaginative powers are cultivated, accuracy and neatness of work are required. Recess plays are regarded as very valuable, for in them the child reveals his true self. Miss Brown read an excellent paper embodying her views on the training of children in the Kindergarten. Inspector Mersereau showed to what extent he considered Kindergarten work could be done in the primary schools.

Election of officers resulted as follows: President, J. F. Oneus; Vice-President, Miss Bessie Ullock; Secretary-Treasurer, G. H. Harrison. Additional members of committee of management, P. Cox and Miss A. G. McIntosh.

Gloucester County, N. B.

The fourteenth annual meeting of the teachers of Gloucester was held at Bathurst, on Thursday and Friday, October 9th and 10th, Inspector Mersereau in the chair. Forty-five members were enrolled. Papers and addresses were given by Mrs. S. Williamson, Miss Lamont, Miss Edgar, Miss Barry, Mr. Branscombe, C. H. Cowperthwaite, A. B., Mr. Jerome Boudreau and Miss Hodgins. One important feature at this institute was the number of lessons given to classes before the institute. The following officers were elected: James McIntosh, President; Mary Nicol, Vice-President; J. E. Lanteigne, Secretary-Treasurer; C. H. Cowperthwaite, A. B., and Theodore Langis, additional members of managing committee.

VICTORIA AND MADAWASKA, N. B.

The second meeting of this institute was held at Edmundston, on the 23rd and 24th of October, Thirty-seven teachers were present. Inspector O'Brien in the chair. Papers were read by Mr. Henderson, Mr. Brundage, Miss Truswell and Miss McGill. They were thoroughly practical and showed careful preparation. Some spirited discussions were engaged in, and the institute, which is the first held in the county of Madawaska, was a decided success. On Thursday evening a public meeting was held, and addresses were made by Inspector O'Brien, Rev. Mr. Armstrong, Dr. Cameron, B. R. Plant, Esq., and others.

The following officers were elected: Inspector O'Brien, President; Mr. Henderson, Vice-President; Miss McGill, Secretary-Treasurer, and Miss Costello and Mr. Martin, additional members of committee of management.

ST. JOHN COUNTY, N. B.

The St. John County teachers' institute met in the Centennial School, St. John, October 30th and 31st, President, Edward Manning, M. A., in the chair. 160 teachers were present. Papers on "Animal Life", as taught in the first four grades, were read by Miss O'Sullivan, Miss H. D. Gregg, Miss Belle Thompson, and Miss C. M. Hogan. Mr. Manning read an excellent paper on "Physical Geography"; Miss Grace Orr read a paper, "Gleanings from Glen Falls, N. Y."; and Miss Murphy, Mrs. Dienaide, and Mr. Hay gave an account of the work done at the summer school at Parrsboro, N. S. A resolution, moved by Inspector Carter, favoring compulsory education, was unanimously adopted. Chief Superintendent Crocket was present and took an active part in the proceedings of the institute. The following officers were elected: President, James Barry; Vice-president, Miss Etta Barlow; Secretary-treasurer, W. C. Simpson; additional members of committee of management, Miss Grace Orr, W. H. Parlee.

The Kings County, N. B., teachers' institute was held at Sussex, October 30th and 31st, but we have received no account of its proceedings.

Astronomical Notes.

Somebody sends the editor the following question, and the editor has sent it to me:

On Oct. 21, by a St. John almanac, the sun sets at 5 o'clock, and is 15m. 21s. fast. What time should the clock show?

The answer to what I take the question to mean is 5 o'clock. But I don't feel at all sure that I know just exactly what it is that the inquirer wishes to know.

There are a few assumptions associated with my answer. As to the almanac, I have assumed that, since it is a St. John almanac, its "sunsets" are calculated for the latitude of St. John, and are given in St. John mean time. And as to the clock I have assumed that it is expected to show St. John mean time. It is with some reluctance that I make this assumption about any clock in this civilized age, but as late, at least, as last August I found the clocks of St. John and Fredericton still keeping this old-fashioned time, and I have not heard since that any change has been made.

With an almanac and a clock, as assumed — and supposing the almanac man to have done his figuring correctly — it ought to be clear that, at the moment of the happening of what the almanac calls "sunset" on the given day, the clock should show 5 o'clock.

That the sun was 15m. 21s. fast on that day has nothing to do with this matter. That does not mean that the sun sets 15m. 21s. before it should set. It means that on that day the sun passed the meridian of St. John 15m. 21s. before the St. John clock showed 12 noon; or, if it suits you to be very precise, it means that when the St. John clock showed 12 noon, the sun dial at St. John — or those clocks there, which are so wonderfully constructed as to keep true sun time — showed 12h. 15m. 21s. That the sun takes such liberties with the St. John meridian at this time of the year must not be taken as an insult specially directed against that city. He does the same sort of thing — and does more of it — even with those cities that have adopted standard time. How it is that he comes to behave in this way is a something you will not fully understand until you have given some time and thought to the study of what goes by the name of the equation of time.

The question above — or something like it — is one that may at some time or other have occurred to more than one reader of the REVIEW. As I have said, I am not quite sure that I know just what it was that the inquirer wished to know. I don't know who he or she is, and there is not time to make inquiries through the editor. So, I have done what seemed to me the next best thing. I have submitted the question to half a dozen of my friends, and asked them to tell me what they thought it was that the querist wished to know, so that I might be in a better position to tell him what he wanted.

A says he thinks the inquirer wants to know if he can use the "sunset" column of his almanac as a test to regulate his clock by.

B says the inquirer has found the "sunfast" column alongside the "sunset" column in the almanac, and thinks the entries mean that the sun would set at 5, if he were a well behaved body, but does really set 15m. 21s. before 5.

C thinks the inquirer has been reading up about the *mean* sun and the *true* sun, and that he wants to know if it is the *mean* sun that sets at 5 and the *true* sun 15m. 21s. before 5, or *vice versa*, or how.

D says the question is one that used to puzzle himself in his younger days, until his minister explained the matter to him. The explanation is this: The sun does really set on that day at 5, but owing to the acceleration of the equinoctial he is 15m. 21s. fast, and, therefore, at the time of his setting the clock should show 15m. 21s. to 5.

E treats the matter as a joke, and F says he gives it up.

D's minister's explanation — so far as it is within my mental grasp — seems much the same as B's view of the matter; and this has been noticed in a previous paragraph. It may be worth while to add that if the entries in the "sunset" column here given in *apparent* time (that is, in true sun time), then the entry in the "sunfast" column would have to be taken into account in answering the proposed question. But in the computation of the "sunset" entries for almanacs now-a-days the "sunfast" business has been already allowed for in the reduction to *mean* time.

As to C's view of the difficulty it should be sufficient to say that it is always the real sun whose settings are recorded in the almanac. The *mean* sun sets at 6 o'clock mean time always and everywhere — refraction being neglected.

A seems to think the inquirer has the idea that his clock should have showed the almanac hour of the almanac "sunset" at the time when he observed the sun to set. If inquirer and his clock are in St. John, and if he knows exactly what it is that his almanac calls "sunset," and if he can manage to observe this particular "sunset," then the above idea is correct. But if any of those three *ifs* are not satisfied — and to satisfy the third one exactly would probably be rather difficult — then the idea is not correct. If not in St. John but at some other place in the same latitude, the time of almanac sunset on that day would be the same as at St. John, viz., 5 o'clock; but this 5 o'clock would not be 5 o'clock St. John time. If not in St. John but at some other place in the same longitude, the sun would set by St. John time, but the hour of its setting on that day would not be 5 o'clock.

The conjunction of Mars and Jupiter on November 13 will probably be past before the REVIEW is out, but the two planets will be near each other for some time after. They have not been so close together as on the 13th since June 1886, and will not be so close again until — will somebody kindly figure it out?

A month or two ago it looked as if Venus would overtake Mars long before he could overtake Jupiter. But just an hour before the conjunction between Mars and Jupiter she came to a dead stop in her eastward journey among the stars. During the next six weeks she will have to back up to where she was in the middle of October. This set-back will handicap her so badly that she will not catch up with Mars until towards the end of next August. The conjunction then will be a very close one, so close that the eye will not be able to see even a streak of sky between them; but they will not then be well placed for observation.

I wish some of the REVIEW readers would try how late in November they can still see Venus, either during daylight or in the evening, and either with the eye or with a glass. If you do, please send me your latest date, with particulars as to the *eithers*.

If any of you would like to look up Neptune in a field-glass during the next six months, drop me a card to indicate your wish, and I will try to give you some help in the next REVIEW.
A. CAMERON.

Yarmouth, N. S., November 1, 1890.

McGILL University has again made another rapid stride in scientific education. A few days ago the corner stone was laid of the technical and mechanical buildings that the governors of the college are enabled to erect owing the liberality of two public spirited citizens of Montreal — Mr. W. C. McDonald and the late Thos. Workman. In establishing such institutions McGill will extend its usefulness by providing for Canadian students that instruction which they have been compelled to seek in technical schools abroad.

COMPULSORY education is receiving a large share of attention both in the press and on the platform throughout the Maritime Provinces. Chief Supt. Crocket, in a recent address before the St. John County Teachers, intimated that when the government perceived that there was a strong sentiment in favor of compulsory attendance it would add a clause to the education act giving power to enforce it. He complimented the teachers of St. John County that they unanimously passed a resolution favoring compulsory attendance at schools, even though they knew it would add materially to their labors.

For the Review.]

Practical Chemistry.

J. Brittain, Normal School, Fredericton.

Pierce a cork which will fit an ignition tube directly through the middle, with the pointed handle of a round file. Then reverse the file, and enlarge the hole (being careful to make it perfectly round) until it is only a little smaller than the glass tube which was bent. Insert the end (*a*) of the tube into the hole, and carefully work it through the cork. It is now ready for use as a delivery tube.

Another glass tube of the same diameter, 6 or 8 inches long, should be slightly bent, not far from the middle. When the end of the longer part is passed through a cork, and the other end inserted into a close-fitting rubber tube 16 inches long, the whole will form another useful delivery tube.

Take one of the large corks which fit the 6-oz. wide-mouth bottles, and make a ½ inch hole through it with the cork-borer, and a ⅜ inch hole with the round file. Cut off a piece of ½ inch glass tubing, 9 inches long, and work it through the cork so far that, when the cork is driven tightly into the bottle, the lower end of the tube will be 1½ inches from the bottom of the bottle. Bend a piece, 6 inches long, of ⅜ inch tubing, at such a point that when passed through the cork the bend will be at the same height as the upper end of the ½ inch tube. This piece of apparatus will be used in generating gases in the 6-oz. bottle.

Heat equably the middle of a small glass tube, for an inch or more, in the flame of the spirit lamp. When sufficiently soft, gently stretch the glass until the diameter at its middle point is about equal to that of a darning needle. When cool, break the tube evenly at its narrowest part, with the help of a triangular file. You now have two tubes drawn to a fine point. Their sharp edges, and those of the delivery tubes, should be rounded in the flame.

Lesson I.

What is in this cup? Air. If we were to take the air out, without letting anything else in, what would then be within the cup? Space. Where is the space now, which would then be within the cup? It is now in the cup. How do we express the fact that both the air and the space are within the cup? We say that the air *occupies* the space. Fill the cup with water. What can we say now? That the water occupies the space within the cup.

Anything which will occupy space is called *matter*. Mention several kinds of matter besides air and water? The various kinds of matter are called *material substances.* The amount of space occupied by a portion of matter is called its *volume.*

Take a wooden cylinder. Place it in a vessel not cylindrical in form. What is its form now? It is still a cylinder. How much space does it occupy? The same as before; its *volume* is unchanged.

Pour some water into a cylindrical vessel. What is the form of the water? It is a cylinder. Pour the water into a funnel which has had its neck filled by a cork. What is the form of the water now? It is a cone. What is its volume? The same as at first. The wood retained both its form and volume, when placed in a vessel of a different form; the water retained its volume, but lost its original form; it conformed to the vessel in which it was placed.

Procure a small bag, made of very thin oiled silk, or other soft, flexible material, impervious to air, fill it half-full, or more, of air, by means of a small glass tube, and then seal the tube. Drop the bag into a bottle somewhat larger inside than itself. Cork the bottle tightly with a stopper, through which a ⅜ inch glass tube has been passed. Insert the glass tube into a rubber one. Take the free end of the rubber tube in the mouth, and draw air from the bottle into the lungs. The air in the bag will increase in volume, and tend to assume the form of the bag. A body which, when placed in a vessel of a different volume and form, tends, like wood, to retain its form and volume, is said to be a *solid*, or in the *solid* state. One which, like water, tends to retain its volume, but not its form, is called a *liquid.* One which, like air, tends to increase its volume and to assume the form of the vessel containing it, is called a *gas.*

Lesson II.

Fill a test-tube with water, which may be colored with red ink, and insert a cork which has had a small glass tube passed through it. Take the test-tube in the wooden holder, and hold it, slightly slanted, in the flame of the spirit lamp. Move it slowly up and down in the flame, so as to heat it evenly throughout its length, without boiling the water. The water will rise in the small tube, while the test-tube remains as full as at first. The water seems to occupy more space. How can that be? Is there any more water? No; for no more was put into the tube. Place a number of marbles, or other small objects, on the table, half an inch apart. How can they be made to occupy more of the table? By placing them farther apart. Do so. If the marbles had been little pieces of water, how could *they* have been made to occupy more of the table? By placing them farther apart. How, then, can we explain the fact that the water occupied more space in the tubes? By supposing that it was made up of little pieces of water, and that these little pieces were moved farther apart by the heat. Heat the end of a brass or iron bar, or rod, which will, when cold, just pass through a hole in another piece of metal. It will not enter the hole now. Why? The metal has been expanded by the heat; that is, the little pieces of metal have been driven farther apart. The small particles of water, and of metal, which were driven apart by the heat, are called molecules.

Drop a bit of starch, as large as a pea, into a test-tube. Cork the tube loosely, and hold the bottom of it in the flame, close to the starch. Soon there will be a black solid—carbon or charcoal—in the bottom of the tube, and liquid drops—water—on its sides. If we heat this water gently, as we did the water in the first experiment, it would occupy more space, but would still be water. If, however, we were to heat it until it became a gas—steam—and then pass it through a very hot iron tube, the water would be broken up into two gases, quite different from steam, called hydrogen and oxygen. We would then have obtained from the matter of which the starch is composed, three different substances—carbon, hydrogen, and oxygen. Now, the smallest particles of starch—the molecules, are starch, and nothing else; whence came these substances? Each molecule of starch must have been made up of a little carbon, hydrogen, and oxygen, and the carbon in the bottom of the tube is made up of the carbon which was in all of them.

Now, although starch can be broken up into these three substances, no one has ever been able to break either of them up into unlike substances. The chemist has been able to divide the carbon contained in one molecule of starch into six parts, and no more. Each of these smallest portions of carbon is called an atom. Similarly, a molecule of starch has been found to contain ten atoms of hydrogen, and five of oxygen.

We will, then, henceforth regard every piece of starch, or other matter, as a heap of molecules, too small to be seen, even with the microscope; and each molecule, as a system of atoms. If the molecules of a substance are made up of atoms of different kinds, as in the case of starch, we will call it a compound substance; but if they are made up of like atoms, as in carbon, we will call it a simple substance, or an element. We will call the force which binds the atoms together to form a molecule, chemical affinity.

Note.—Add to the list of apparatus given last month: a 1-oz. Glass Funnel, 15c.

Notes for Teaching Music by the Tonic Sol-fa Notation.

Tenth Paper.

In our last paper we spoke of transition into the first key to the left—the first flat key—Key F. If we go on to the second, we find that f again becomes d, and that d has been brought down an octave and one tone, by two removes. Disregard the octave, and think of two removes to the left as bringing down the pitch one tone, *i. e.*, to B (flat). We may then say:

2	removes	or	2	flats	gives	us	key	B flat
4	"	"	4	"	"	"	"	A flat
6	"	"	6	"	"	"	"	G flat
1	"	"	1	"	"	"	"	F
3	"	"	3	"	"	"	"	E flat
5	"	"	5	"	"	"	"	D flat

On the modulator you see that when we use instead of any note, the sharp of that note, we put the vowel e after the consonant. Thus:

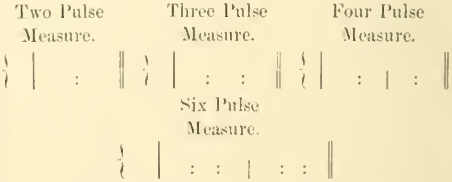
d sharp is de　　f sharp is fe
r " " re　　s " " se
l sharp is le

Again, when we use instead of a note, its flat, we put the vowel a after the consonant. Thus:

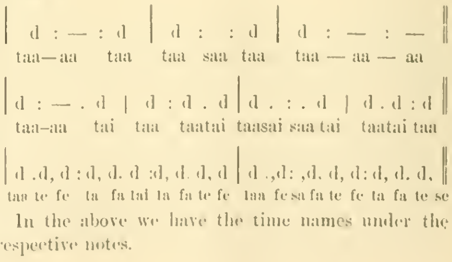
r flat is ra　　l flat is la
m " " ma　　t " " ta

To distinguish la from lah, pronounce lay.

TIME.



Six pulse measure is made up of two measures of three pulse measure, where every second strong accent becomes a medium accent, just as four pulse measure is made up of two measures of two pulse measure.


| d : — : d | d : : d | d : — : — ||
taa—aa taa taa saa taa taa — aa — aa
| d : — . d | d : d . d | d . : . d | d . d : d ||
taa–aa tai taa taatai taasai saa tai taatai taa
| d .d, d : d, d. d :d, d. d, d | d .,d: ,d. d, d: d, d. d, ||
taa te fe ta fa tai la fa te fe taa fe sa fa te fe ta fa te se

In the above we have the time names under the respective notes.

EAR EXERCISES.

These should begin sufficiently simple for all the class to take part, The first step is to get the class, and also individuals, to imitate two or three notes, sung to the syllables. Then imitate a few notes sung to figures, or to lah. Next get the class to recognize one particular note—say d—when singing to figures, or the syllable lah. Then s may be distinguished; next d and s; then m; and afterwards, any of the notes of the doh chord. These exercises should begin with the first lesson. Get every pupil to answer individually. Ask a section of the class to stand, and let each pupil sit only after he has answered a question. The first answer that some of the pupils may be able to give may be simply to distinguish between two notes, a third, a fourth, or a fifth, apart, as to which is higher, or, of two notes, which is the longer; and gradually lead the dullest pupils up from this low point. In this way the pupils that think they can never learn ear exercises will soon be delighted to find that they can actually take part. Now let the teacher sing two or three notes of the doh chord to lah. Ask the class to copy it. Ask the class again to sing to lah, but this time making the manual signs. The teacher, at first, to help and to encourage the class, may make the manual signs with the class, and notice what proportion are making the signs independently.

In grades one and two, the class may be considered to do well if they can tell the notes of the doh chord, in simple phrases of not more than three notes; or to copy such phrases as below, without being asked to tell the names of the notes, when sung to lah.

m r d ‖ s f m ‖ m f s ‖ d r m ‖ l t d^1 ‖
d t$_1$ d ‖ m r m ‖ s l s ‖ d^1 t d^1 ‖ s s m ‖
d m r d ‖ s m f s ‖ s l s m ‖ f m r d ‖

After the pupils sing these phrases to the syllable lah, let them sing them with the teacher, to the tone syllables, the teacher pointing the notes on the modulator (which should be before the class during the ear exercises), or the teacher and the class making the manual signs.

The teacher should take few answers from the bright pupils. Frequently work with and encourage the backward pupils.

Grade three will do well if they can name the syllables of the simpler of the above phrases after they have been sung carefully by the teacher, twice, to the syllable lah.

CORRECTIONS.—In last paper, page 76, second column, near middle, read "note ta" instead of "td"; three lines down, read "fah" instead of "lah".

J. ANDERSON.

Musquodoboit Harbor, N. S.

For the REVIEW.]

High School Studies.

Sir John Copley (afterwards Lord Lyndhurst), was once retained for the defence of a patent right held by the inventor of a machine for making lace. The great lawyer confessed that he could not understand the brief without first mastering the details of the invention. He placed himself in the lace loom, and did not leave it till he could make a piece of bobbinnet and explain the principle of the machine. Every lawyer of large practice has thus to grapple with practical questions. It may be the joints or tendons of a horse, the action of an electric current, or the strata of a mine. And lawyers are not alone in this. Everyone engaged in useful work has need of scientific information. Based upon this undeniable fact is the tendency to make our school curriculum more and more scientific. This, however, should not be the controlling consideration in the drawing up of a curriculum. When a man has to decide and act in any important matter, he needs two things, as far as mental equipment is concerned, namely a trained mind and information. Of these, the former is by far the more important. Men of sound judgment are more in demand than men of varied knowledge. Information can be had as occasion requires, if the mind has been trained; it is of little use in the absence of that training. We all admit, in theory, that "of education, information itself is really the least part"; but, in practice, we too often reverse the order of relative importance. For instance, we sometimes require a student to undertake too many different branches of knowledge at once. There is a limit, beyond which the number of branches ceases to be educative, and becomes confusing. In the October number of THE EDUCATIONAL REVIEW, I find this sentence: "Time is now frittered away on so many subjects that nothing is well done, and with the most disastrous effects on the habits of the learner." Where this applies, there is no solid culture of mind. Educationists in Nova Scotia are now engaged in forming a course of studies for high schools, and I beg to suggest a preliminary question. It is this: How many different studies can a pupil profitably take in one year? The *profitably*, here, has reference to thought, not to future use. The process of thought requires time in any one branch. The evil of attempting too many subjects does not usually consist in overtaxing the mind, but in the absence of genuine thinking, as the student skips quickly from branch to branch. The new course is more likely to require too many studies, than too few. In the first year of the arts course at Dalhousie College, the ordinary studies for B. A. are, three languages, mathematics, and inorganic chemistry. For B. Sc., botany is substituted for Latin. Here there is room for intellectual work. The present requirements for grade B. teachers' license are: one language, mathematics, chemistry, physics, physiology, history of the world, and British history, geography (with particular attention to astronomical and physical geography), and bookkeeping. French may be taken instead of English literature, and Latin instead of physiology. When all these studies are attempted in one year, the work is, as a rule, superficial. It is memory work, not intellectual work. The mathematics alone requires two hours per day of class work. In his convocation address, last year, Sir Daniel Wilson, President of Toronto University, recalled an utterance of the late Matthew Arnold on this subject. Arnold was for many years an inspector of schools, and when reviewing his experience as inspector, he remarked, with reference to pupil-teachers, "I have been much struck, in examining them towards the close of their studies, with the utter disproportion between the great amount of positive information and the low degree of mental culture and intelligence which they exhibit." What we need in the teacher is the very reverse of this. A few branches at a time, thoroughly studied, will give it. Many branches attempted in each year of the high school course, can only give us teachers who will in turn stuff the pupils of the common schools.

N. McNeil.

Antigonish, N. S.

For the Review].

Teachers' Work.

I think The Educational Review for September is a good practical copy. Many of its suggestions can be carried out in our primary schools with beneficial effects. A few, however, would be attended with some difficulty. The reason of this, to a great extent, can be attributed to the age of our school system. In looking over the course of instruction, many subjects present themselves to the old time teachers who have acquired their position without them; and when the progressive teacher introduces those subjects into the schools many parents look upon them as useless.

For example: Something less than five years ago, I had agreed to teach a certain school. Although I taught that school for four years, I came very near losing it at the end of the first term. Many of the children came with reader, arithmetic, slate and copy, thinking they had all the books required for their several grades. Had I given those scholars with fifth, fourth, and third readers, three reading lessons a day, I would have been looked upon as a teacher good enough, but if I had given them six reading lessons a day I would have had my salary increased at the beginning of the second term.

Such subjects as geography, grammar, history, useful knowledge were looked upon as all very well for those who had a taste for such things, but was not considered a lesson or task; and such subjects as composition, drawing, printing, or anything that would crowd out a reading lesson was considered as so much time thrown away.

In grade IV, and even in grade V, I found pupils who could not tell how much four tubs of butter, each weighing 52 lbs. at 18½ cts. per pound, would bring. Or that fifteen pence was 1s. 3d.

In such schools, and we find many, the teachers have hard and difficult work to get all the subjects arranged to please both pupil and parent. He must please as well as instruct, if he hopes to retain the school more than one term, for if he does not teach longer, he cannot introduce the several subjects found in the course of instruction to much profit. Hence the propriety of trustees engaging teachers for the year instead of six months.

A. M.

Queen's County, N. B.

For the Review.]

Kindergarten Methods in Primary Schools.

Second Paper.

The second gift consists of a sphere, cube, and cylinder made of wood. The ball of the first gift, described in the last Review, is soft, rough, light, and almost soundless; the sphere, cube, and cylinder are hard, smooth, heavy, and resonant. The cylinder and cube differ from the ball in form; the sphere is like it. The sphere and cube are opposites, while the cylinder forms the connecting link between the two, as it partakes of the appearance of both. In this gift contrasts of motion and form are at once detected. The cube will slide, not roll. The cylinder will slide and roll. All the differences are observed by the child, and the contrast of the straight line with the curved at once perceived.

The ball delighted the child, but the sphere, because of the noise it will make, has a greater charm. Children enjoy making their playthings speak, and in dropping hard substances, or knocking them against the table. To them "noise is life." All the ball games can be used with the sphere, and here are some rhymes:

For the sphere:

1. The sphere fills up my little hand,
   The cube within it cannot stand.
2. If nothing holds the little ball,
   To the ground we see it fall.
3. Round and round, 'tis my delight,
   From right to left, from left to right.

For the cube:

1. The cube is now resting, it stands on its face,
   And standing so firmly, cannot lose its place,
2. The cube can't stand on edge, 'tis clear,
   It tumbles there, it tumbles here.
3. With a stick through my centre, I rapidly run,
   And my corners and edges delight in the fun.
   To you they are hidden, but there they remain,
   And when I stand still you will see them again.

For the cylinder:

1. With a stick through my centre I turn round and round,
   And look like the roller that rolls on the ground.

These plays bring out the child's active nature.

The sphere should be at first compared with other objects, and the child might be blindfolded and a ball, apple, or potato given in its hands, to notice difference or similarity. The cube is studied in all its parts; faces, edges, corners, and conceptions received of up, down, back, front, left, and right. The child finds out that only three sides can be seen at one time, and by holding it up by a string, pulling it along by a string, or revolving it on its different axes the idea is given of different kinds of motion. When quickly turned on axis of faces it presents a cylinder, on axis of edges a wheel, and on axis of corners a double cone. Its surfaces are compared with those of other objects in the room. Level smoothness is noticed in opposition to sharpness of edges. Lines of the surfaces are taught by comparison and illustration, and shape of surfaces taken up later. The cube is compared with a square stone, a block, bale of cotton, box, table, house, etc. The cylinder is taken up now, and at once gives ideas of rest and motion. If turned quickly it presents to the eye the sphere and double cone. And the law deduced from these revolutions is that the sphere is contained in, and contains all the forms of these bodies in itself, as it appears in the cylinder, and the cylinder and cone appear in the cube. The cylinder is compared to the trunk of a tree, the arm, finger, neck, etc.

In the first lesson the red ball of the first gift and the wooden sphere are shown. If possible let each child have one in its possession. Ask for the shape of the ball, with which all are familiar, and of what each is made. Hold a conversation about trees to find out how much the pupils know, leading them to think of how they have to be cut down, about the lumber which is cut up in the mill, and who made the balls. There is a pretty story, with good illustrations, in *Babyland* for November, 1889, with which some little folk I know were delighted. The teacher drew the pictures on the board, and taught them the story:

THE STORY OF BABY'S CRIB.

There was once a tree, baby dear,
  And it grew and grew,
  Till the sky so blue
Seemed right at its top, baby dear.

A man brought an ax, baby dear,
  And he chopped and chopped,
  Till the branches dropped
And crash! fell the tree, baby dear.

Away to the mill, baby dear,
  Did the tree go then,
  And the busy men
Sawed it into boards, baby dear.

The carpenter worked, baby dear,
  With a saw again,
  And his hammer and plane,
And made you a crib, baby dear.

Papa brought it home, baby dear,
  And so, from the tree
  There has come, you see,
Your own little crib, baby dear.

The picture of the tree, of the woodman cutting it down, of the ax, saw, plane, hammer, nails, etc., gave the children a number of things to think about.

By rolling the red ball we find out it makes no noise, and we compare it with wooden ball which makes a noise. Why does it make a noise? Feel the wooden ball. It is smooth. What shall I call this part of it? The outside, some one says. Put your hand on your head, on your face. What do we call the front of our head? The face. Well, we shall call the outside of the ball its face. How many faces has it? Just as many as we have. How many have we? One. Tell me the name of some objects which have only one face. What shape is this face? Show me some objects that have round faces.

We do not lay any stress on the name of *sphere*, but as the teacher uses it the children learn to say it when speaking of the wooden ball to distinguish it from the woollen one.

In the second lesson we take the block or cube, and by comparison give ideas of its flat faces. The teacher holding a sphere up between her thumb and finger of the left hand, asks the child to do the same with his, and also to turn it over with the pointer finger of the right hand. Ask of one to tell what he is doing, and of another the name of the part touched. Repeat this exercise with the block, or cube. As the teacher uses the name *cube* they become familiar with it and use it too. Have all touch the face of the cube (which some may call sides.) Speak of what this cube is made. Have all close their hands around their sphere, and ask of one what kind of a face it has? Let all feel the face of their desk. Is the face of one the same as face of other? Show with pointer how much of sphere can be seen at one time. Why cannot all be seen? Show the part seen and the part not seen. How do you know that part is there if you cannot see it? Touch it. Compare the face of sphere with face of desk and other objects in the room. Move hands along the face of the desk, place them at right side, at left, on top, etc. Moving the hands slowly over the top of the desk, find out what kind of a face it has, and ask which it is like—the sphere or the block. It is flat like the block. Find flat faces of other objects in the room, and also round faces.

(To be continued.)

For the REVIEW].

A Teacher's View.

The following is a good sample of the vigorous letters we receive on the docking of teachers' grants:

"* * * * I, for one, am getting tired of tamely submitting—but the action may please you less than the submission. However, such as my opinions are, I offer them for the consideration of your readers.

"One reason, I think, for the inaction, is the smallness of the amount which each teacher loses yearly. No one cares to bestir himself very much for five dollars a year. But if we do not mind the loss of the amount, let us show our resentment to the principle of cutting down educational grants.

"In these days of strikes, labor unions, etc., no one, I believe, has heard of a strike among school teachers to raise their meagre salaries. Perhaps this is owing to the tameness of which you complain, as there can be no doubt that they have been oppressed.

"To be sure, the lesson which we learn from strikes in general, is that they do not pay, and that they are better left alone. But I do not see why a well-organized and sufficiently large union of teachers should not be able to force the government to do what they are not likely to do until they are forced, viz., repeal the obnoxious clause, by refusing to teach until this is done. There can be no doubt that such a body would have a great deal of power, for it is a serious thing to have our schools closed.

"Though no one may agree with my views, I have at least shown that one teacher is imbued with the spirit of ACTION."

["Action" is right in his reference to the unsatisfactory nature of remedy by "strikes". And if the action of the government is sustained by the country, that is the end of the matter, under constitutional procedure. It is also the beginning, for if the teacher can make it evident to the majority of the people that the people's interests in the long run are injured by the arrangement, then the remedy is near. The teacher must become a more influential personality in each section of the country. That consummation will gain for us this and many other reforms. Let us continue stimulating each other, in every possible direction which can be suggested, providing the directions finally converge to make us better, and therefore more truly powerful. But there is a reform in connection with this same matter in Nova Scotia, which the government should make instantly, which will be to the advantage of everyone, which will do away with a great abuse of time and energy, and which, therefore, the government will make, as soon as it is pointed out.—ED.]

For the REVIEW.]

Mr. Editor,—As your subscribers have had the opportunity offered of forwarding to THE EDUCATIONAL REVIEW such suggestions as may be thought useful in order to make it a more beneficial paper for the teachers, I avail myself of the opportunity. I am of the opinion that your paper may be made more useful in the hands of a majority of the teachers in the following ways:—

First, that a column in each issue be given for the purpose of asking questions in connection with school work. Second, that a column or so be given for examination papers set by teachers of different standards. In regard to the first it would be of great benefit to teachers to send questions and have the opinion of others more capable of forming a judgment than themselves.

In regard to the second suggestion I think teachers would be pleased to see papers set by other teachers for the purpose of comparing the work of the same standards in order to secure greater uniformity and to indicate the lines which different teachers take in teaching the same subject.

H. W. MURRAY.

Shediac, N. B.

[There is already a Question Department in the REVIEW, and we are always glad to have questions proposed, especially those that show that an earnest teacher is earnestly grappling with some difficulty. There are others who have met and overcome the same difficulty, and who, if questioned will furnish from their experience what will aid others, especially in school management. Let there be a freer interchange of opinion in these columns. In regard to the second point proposed by our correspondent—examination papers, or better still, plans of conducting a lesson, such as that given by a Northumberland County teacher in the October REVIEW, would be of great service.—EDITOR.]

Mannerisms.

Teachers cannot be too often reminded that the man is greater than the schoolmaster. A physician of education has recently said in the *Mail and Express* that "one of the first things that impresses itself on the mind of one visiting some of the schools of this city is the peculiar school-room manners that are assumed by the principal and teachers. It seems as though one had stepped into an altogether different world than his own. The principal welcomes his visitor with an impressive professional smile. His accent and the tone of his voice is altogether different than is found on the street or in business life. The visitor feels that it would be highly inappropriate to undertake any kind of conversation but one upon school topics. He is impressed with the idea that the teacher has an entirely one-sided culture. This is the way I have felt upon entering a school room. I have had principals courteously escort me through the recitation rooms in their various schools. Every room they entered they followed the same formula of saying, with the same peculiar combination of accents and inflections, 'Good morning, girls,' or 'Good afternoon, boys.' Every time the class would answer with the tone and inflections as used by their principal, 'Good morning, Mr. Blank.' Then occasionally the principal stops in his tour of inspection and devotes a little time to putting a class through their paces. With a nursery voice he chirps, 'Now children, let me have your attention for a moment. I am going to give you a little talk. Do you know what I am going to talk about?' And the class, in their school-room voice, chime in, 'Yes, sir.'

"Now, of course, this is a small thing to criticise, but I don't like these ways of principals or teachers. In my estimation a teacher ought to be as practical a man as can be found in any other business. I don't think nursery methods should be used with school children that are not very young. The school room ought to be a practical and every-day affair. Personality should be given every chance to develop. A teacher ought to be a person of sufficiently broad culture to understand that teaching does not consist in making the students all diminutive copies of himself.

"Narrowness or mannerism should not be cultivated in the schools. Teachers should, in my estimation, strive to be more practical and not get into a peculiar rut of their own. I think that boards of trustees ought, in hiring teachers, to have an eye to securing those who are practical as well as educated.

Discipline in Schools.

Complaints are frequently heard of the rigidity of discipline in the public schools. Children are expected to obey without questioning and to do their work like automatons, in the most mechanical way. Instructions once given to a class are not to be modified. If the teacher be so weak and inconstant as to change her mind, it is assumed that her authority will be at an end. Her personal infallibility is a dogma of modern education. She makes no mistakes either in sums of addition on the blackboard or in any details of administration. No precocious lad or demure little miss must ever be allowed to catch her napping or to trip her up in her talk. If there is untimely controversy from the benches, there is vigorous application of the everlasting marking system. The inquisitive child gets ten marks for deportment, and is thereby taught to hold her tongue. Children must be taught to do everything mechanically and to conform not only to the general regulations of the school-room, but also to the caprices and whims of the powers that be. Arnold of Rugby never worked across the grain of a sympathetic boy's affections. It was the type of teacher that excited the lamented Matthew Arnold's most cynical sarcasms in his active career of educational inspection in the English schools. He could not tolerate heartlessness. If there be one place above all others where his gospel of sweetness and light needs to be taught, in season and out of season, it is in the school-room.—*New York Tribune.*

Interest Your Pupils.

We say to teachers, above all things seek to interest your pupils. This is not always an easy thing to do and may now and then be next to impossible, but we are strongly inclined to think that the fault is oftener, much oftener, in the teacher than in the pupils. He who teaches perfunctorily and who looks forward to the end of the day with longing because it brings a cessation of school work, will generally find his pupils in the same frame of mind. Almost all young persons as well as old take greater interest in some subjects than others, but the less interesting can be so managed that they will be taken hold of with alacrity if it be only to get them out of the way of something that is more agreeable. Broad culture and a wide range of knowledge in the teacher places within his reach a variety of resources that will almost always enable him to accomplish the desired object. Genuine culture is not within the reach of all, whether teachers or not, but it is the teacher's own fault if he does not daily add to his stock of knowledge. "Many a little makes a mickle," and those who are best informed are not as a rule those who have the most leisure but those who know best how to turn every opportunity to some useful account.—*Journal of Pedagogy.*

Educational Opinion.

I cannot impress too strongly on the minds of students whose bent may be towards mathematics, or metaphysics, or natural sciences, the importance of giving a considerable part of their time to languages, and at any rate to that sometimes neglected, but always noble, English tongue in which it is our privilege to speak. No man should quit our halls without a competent acquaintance with our own language, without learning to appreciate and so to love its literature, and clearly to express in it his thoughts by tongue and pen. Especially should the art of expository composition be cultivated. What you know is of but little use unless you can communicate, and explain, and enforce your knowledge. * * * Beyond all utilitarian advantages is the enormous gain of acquiring, what such studies will surely give, a love for English letters, a love which will grow with use, and will secure to you the cheapest and most satisfying, the highest and most enduring, of earthly pleasures and consolations; so that, whether we look to success or to enjoyment, we find one course chalked out.—*Hon. Edward Blake's Toronto University Address.*

It is thought by some teachers that the study of chemistry, botany, and kindred subjects, as well as farming and practical management of soils and agriculture and horticulture, will give pupils common sense. We don't believe it. A boy is just as likely to go out with strong common sense from a thorough classical course of study as from a farm. It all depends upon how he has been taught. If his early education has been so conducted as to divorce from him all attention to the world of action as it is, he will be very likely to be deficient when he comes into the arena of life. Common sense comes from hard work, usually. It is a very good thing for a boy to do a good deal of hard manual work; it fits him for hard thinking and sound judging.—*School Journal.*

It is to very little purpose that we establish fine public schools at very considerable expense and assess ourselves large sums of money for their maintenance, if any considerable section of the population refuses to send their children to them. The only remedy for this state of affairs seems to be to adopt the compulsory school system and make it necessary for a parent to send his children to school a certain number of days every year, unless prevented by illness or other causes which cannot be removed.—*F'ton Gleaner.*

Ladies must take their places at teachers' meetings, not as learners, but as teachers, they must preside at such meetings and discuss educational questions as men do; they must read papers and give utterances to their opinions; if they have ideas they must express them, for if they do not do so, they cannot censure the public for mistaking their silence for ignorance. Ladies must do as gentlemen do in these respects before they can hope to occupy the same position. This they cannot do without undergoing the same process of training that men undergo to fit them for public duties.—*Winnipeg School Times.*

Teachers are frequently heard to complain that they have no time to devote to their own mental improvement, because school duties occupy it all. There is a way in which the preparation for school duties, however humble or elementary, may conduce to the teacher's own improvement. But generally when a teacher has no time for "outside reading" or "outside study", it is because he has not learned how to utilize the spare moments and has but little desire to do so.—*Journal of Pedagogy.*

Eighteen words have come into the language—probaby temporarily, most of them—to denote the act or state of electric killing. They are as follows: Electromort, thanelectrize, thanatelectrize, thanatelectrisis, electrophon, electricise, electrotony, electrophony, electroctony, electroctasy, electricide, electropœnize, electrotheuese, electroed, electroeution. flumen, voltacuss and electrostrike.—*Garratt, in Scientific American.*

About $4,000 has been raised after a public meeting in New Glasgow, N. S., as a part of the new fund of $50,000, required for current expenses in Dalhousie College.

School and College.

Frank R. Haley, B. A. (Acadia), 1884. B. A. (Harvard), 1886, has been appointed to the new chair of Physics and Astronomy at Acadia, Wolfville.

Rev. W. A. Young was appointed to the staff as instructor in English Literature, Homiletics and Hebrew. Acadia has re-introduced the teaching of theology into its course.

The property and furnishings of the Halifax Ladies College cost up to date, $71,306. The gross receipts for the year 1889-90 was $32,693.22, giving a surplus of $1,247.66 above expenditure.

All departments of the College and Conservatory are in active and efficient operation. The attendance at the College last year was 220; and at the Conservatory of Music, 240. The whole number in attendance during the year was 360, of whom 90 were resident pupils. Some changes have taken place in the College staff. Miss Newcombe and Miss Caldwell have retired, and Miss Seabury, B. A., of Smith, and Miss McNeil, B. A., of Dalhousie, have been appointed in their stead. Mr. King-Pooley has been appointed to give instructions in sight reading in music to all the pupils in the College and Conservatory.

The College aims at the highest educational standard and excellence. Miss Leach, the principal, and her large staff are doing good work. The department of Fine Art, under the management of Miss C. F. Howard, is doing excellent work, and gives satisfaction to all concerned. The Conservatory of Music continues in a most efficient state, under the direction of Mr. Porter. The attendance at the College and Conservatory was larger last year than on any previous year.

The new member of the faculty of Acadia College, is Professor Young.

The Presbyterian Synod withdrew its grant for the support of the chair of logic and psychology, which was filled by the late Dr. Lyall in the University of Dalhousie, and appropriates it for the Pine Hill Theological College, at Halifax.

St. Francis Xavier College, at Antigonish, N. S., with better facilities, is rapidly developing an increased attendance of students.

The New Glasgow High School, N. S., is taking rank above the majority of County Academies. After the 1st of November, Principal E. MacKay, an honor graduate of Dalhousie in Physical Science, has associated with him, in a collegiate capacity, Principal

Coops, of the Inverness County Academy, an honor graduate of Dalhousie in classics; and Principal Grant, of North Sydney High School, C. B., also a graduate of the same university. All three had been "Munro Exhibitioners" in their college days.

C. Stanley Bruce, Vice-Principal of the Albro Street School, Halifax, has been appointed to the principalship of the Shelburne County Academy.

E. B. Smith, B. A. (Dal.) succeeds Homer Putnam, B. A. (Dal.) in the Truro Academy as one of the colleagues of Principal Campbell.

PERSONAL.

The many friends of Inspector D. P. Wetmore, Clifton, N. B., will learn with pleasure that he has almost recovered from his long and severe illness.

Principal Campbell, of the Truro Academy, spent his holidays in a tour through England and Scotland, part of the time of which was spent in visiting the educational institutions of the country.

N. C. James, Professor of Modern Languages in the Halifax Academy, spent the vacation in cis-Atlantic France — St. Pierre — keeping up his acquaintance with the French.

From English reports, Dr. Allison, Superintendent of Education for Nova Scotia, appears to have had a pleasant and profitable educational tour on the continent and in England and Scotland during the last two months. Professor Eaton, of the Normal School, on his way to Germany, was, for a portion of the time, with him. We shall expect some benefit also for our readers, as a result.

Principal J. B. Calkin has returned from an educational trip to the United States.

Miss Antoinette Forbes, B. A., (Dal.), has been appointed to the academic staff, Yarmouth. Miss McNeil, B. A., (Dal.), has been appointed to the staff of the Ladies' College, Halifax. Kings County Academy at Kentville has affiliated to the University of Dalhousie.

We are glad to learn that Inspector Smith, of Petitcodiac, N. B., is recovering from a somewhat serious illness.

Question Department.

E. F. Will you please work out the following in the next REVIEW?

"A person buys 6 per cent, Toronto bonds, the interest on which is paid yearly, and which are to be paid off at par, three years after time of purchase; if money be worth 5 per cent, what price should he give for the bonds?"

One year after purchase he would receive $6 interest of which present worth $= \frac{6}{1.05} = \$5.7142\ldots.$

Two years after, he would receive $6 interest of which true present worth $= \frac{6}{1.1025} = \$5.4421\ldots..$

Three years after, he would receive $6 interest and $100 principal of which true present worth $= \frac{106}{1.157625} = \$91.5668+\ldots.$ Therefore, total present worths $= \$5.7142\ldots + \$5.4421\ldots + \$91.5668\ldots = \$102\ 723\ldots$ *Ans.*

[NOTE. (1) $1 amounts in *one* year to $1.05; ∴ $1 is p. w. of $1.05. (2) $1 amounts in *two* years compound interest and 5 per cent per annum to $1.1025; ∴ $1 is p. w. of $1.1025 two years hence. (3) $1 in *three* years amounts to $1.157625; ∴ $1 is p. w. of $1.157625. Hence the present worth (1) of $\$6 = \frac{6}{1.05}$ and (2) of $\$6 = \frac{6}{1.1025}$ and (3) of $\$106 = \frac{106}{1.157625}$]

G. W. Will you kindly inform me where I can get small hand maps, such as Mr. March mentioned at the Institute at Moncton?

Perforated maps are published by the Educational Publishing Company, Boston.

Relfe Brothers & Company, 6 Charterhouse Buildings, Aldersgate Street, London, publish maps for mounting on card board, at a halfpenny each. Atlas containing sixteen maps for 6d.

Collins & Sons, Glasgow, publish a sixpenny atlas, containing sixteen maps full colored.

J. Bartholomew, Edinburgh, publishes individual maps, plain, or mounted and varnished, from 6d to 1s per dozen.

Nova Scotia School of Agriculture.

The closing exercises of the provincial School of Agriculture at Truro, took place October 21st, with the usual eclat. Hon. W. S. Fielding, Hon. A. C. Bell, Colonel William Blair of the Dominion Experimental Farm, the Mayor of Truro and Principal Calkin were on the platform. Several papers were read by graduates of the school, viz: "Potato Culture," by D. Herbert Smith of Truro; "The Relation of Botany to Agriculture," by Edward L. Moore of Halifax; "Experiment Stations," by Fred L. Fuller of Kings County; "Agricultural Education," by Joseph D. McKinnon of Cape Breton.

Professor Smith, who has charge of the school and the Experimental Farm, then gave his report which is summed up in the Truro *Guardian*, as follows:—

> Professor Smith gave a short account of the work of the farm and school during the past year. During the year twenty-five students have been enrolled in the school; twenty-three have attended during a portion of the year, while fifteen have been here the most of the time. Of these, four received diplomas and one a certificate. Our students come from nearly all parts of the province, twelve counties

being represented, while Ontario and New Brunswick sent students. The Island of Cape Breton has had three students here and every county of Nova Scotia except Antigonish, as far west as Annapolis, has sent one or more students. Teachers' diploma was awarded to Mr. J. D. McKinnon and Farmers' diplomas to D. Herbert Smith, Fred L. Fuller and E. L. Moore Mr. W. H. Maxwell had not attended the whole term but had done excellent work, particularly in the natural sciences, and was awarded a certificate.

Hon. A. C. Bell then gave an address on "The Relation of the Farmer to the commercial Prosperity of Nova Scotia," and was followed by Hon. Mr. Fielding and Colonel Blair.

Professor Smith announced the intention of establishing a butter factory on the provincial farm.

The province has good reason to be congratulated on the successful beginning of this institution.

BOOK REVIEWS.

The Calendar of the University of King's College, Windsor, Nova Scotia, 1890–91. This is a well got up volume of 182 pages, specially interesting on account of examination papers. The University has five schools, viz.: The school of Arts, of Divinity, of Engineering, of Science, and Civil Law. It is prepared to grant the following degrees: Bachelor of Arts, Master of Arts, Bachelor of Engineering, Master of Engineering, Bachelor of Science, Master of Science, Doctor of Science, Bachelor of Laws, Doctor of Laws, Bachelor of Divinity, Doctor of Divinity, as well as the title of Associate in Arts. Its various faculties consist of six professors, one tutor and six lecturers. The number of students in attendance during the past year is not given. The University seems to begin its second century with renewed vigor.

The University of King's College, Windsor, Nova Scotia, 1790–1890. By Henry Youle Hind. New York: The Church Review Company, 1 and 3 Union Square, 1890. Received the above containing the following fly leaf: "For Review. To the editor of the Educational Review, St. John. Title: *The History and Story of King's College.* Price one dollar and fifty cents. With the compliments of T. C. Allen & Company, Booksellers, Stationers, and Newsdealers, etc., 124 Granville st, Halifax, N. S."

Annual Circular (Twenty-Second Year) of the Ontario Business College, (Registered), Belleville, Ont, Canada, cor. of Front and Bridge streets. Robinson & Johnson, principals and proprietors, and publishers of the Canadian Accountant, 1890–91. A well printed volume of 100 pages.

Progressive French Reader.—First part containing selected pieces, with questions, notes, and vocabulary, edited by H. H Curtis, and L. R Gregor, B. A, French Masters, High School of Montreal. Publishers, W. Drysdale & Co., Montreal We have perused this introductory French Reader with very great pleasure and satisfaction. Our examination of its contents — their arrangement, character, and utility — has necessarily been brief, but during the process we have had ample opportunity to observe and admire many of those features which make it one of the best elementary French Readers which have yet come under our notice. The passages are carefully selected and judiciously graded. At first easy, never difficult, and always attractive, they provide a desideratum in the teaching of the French language. The questions are excellent, and, being so constructed that they can readily be answered from the text, they give the pupil confidence and facility in expressing himself intelligently in French. The subjects are manifestly chosen with a view to immediate practical results in using the language, for in idiom and vocabulary the learner is, at the outset of his study of the French tongue, made familiar with every-day things and forms of expression. The notes are admirable, and must, in conjunction with the exercises, prove helpful in clearing away those stumbling-blocks to English pupils, the "verbs Réfléchis" and the "Passé Indéfini." And with the excellent vocabulary students can have no difficulty in preparing the lessons without assistance, and must thereby acquire self-reliance and accuracy in expression which are in themselves an education. By exercises in re-translation the accomplished teacher may still further familiarize his pupils with French idioms, and lay a good and lasting foundation for higher acquirements. We confidently and heartily recommend it to teachers, and trust that it may be received with the favor which it so deservedly merits.

Sadler's Practical Arithmetic, for use in high schools, academies, and the higher classes in grammar schools, by W. H. Sadler, president, founder and proprietor of Sadler's Bryant and Stratton Business College, Baltimore, and W. R. Will, principal of the mathematical department. First edition; cloth, 310 pp., 8 in. by 6 in. Baltimore, Md., U. S. A.: Sadler Publishing Co., 10 and 12 N. Charles street, 1891. A capital commercial arithmetic, with some novel methods, and thoroughly up to date.

Comprehensive Volapuk Grammar, by Alfred A. Post. Paper; 62 pp., 5 in. by 7½ in.; $0.50. Mattapan, Mass., U. S. A. Published by Alfred A. Post, 1891. This small volume contains the grammar of the simplest and most regular language in the world, some reading exercises and a small vocabulary. The grammar can be mastered in a week quite perfectly. It is an attempt to restore the world to the mythical golden age of the pre-Babelites. The language has already quite an extensive literature, the publications being numbered by the hundreds in all the leading languages of the world. It is an extremely interesting experiment. Phonetic English would, however, in our opinion, have a better chance of winning ultimately the goal of universal language.

Geography of Europe, by Jas Sime, M A.; India Burma, and Ceylon, by Henry F. Blanford, F. R. S.; Maps and Map Drawing, by Wm A. Elderton. Publishers, MacMillan & Co.: London and New York. The above are three volumes in MacMillan's geographical series. The first and second aim to present the physical features of the countries named, in connection with the leading facts relating to government, population, and national character, industries, products, and trade. Especially are the historic features of the countries worked in very admirably. The third, a primer, is devoted to the history of maps and surveys, and instructions to students how to construct them. The three are brief and excellent compendiums of geography.

Burke's Reflections on the French Revolution, edited by F. G. Selby, M A Publishers, MacMillan & Co.: London and New York. Burke's essay has been here carefully edited, with introduction and notes.

Hand book of Latin Writing, by Henry Preble, A B., (Harv.), and Chas. P. Parker, A. B., (Oxon.) Price 50c. Ginn & Co., Publishers: Boston. This is a good book for advanced students in Latin composition.

Historiettes Modernes, edited by C. Fontaine, B. L., L. D., Professor of French, Washington, D. C., and *DeMusset's Pierre and Camille*, edited by O. B. Super, Ph D., Professor of Modern Languages, Dickinson College, Carlisle. Pa. Publishers, D. C. Heath & Co , Boston. The first of these books is a continuation of volume No. I. of *Historiettes*, published in November, 1888, and of which four editions have already been issued, sufficiently attesting its popularity.

Deutsche Literaturge schichte, by Carla Wenckebach, Professor of German Language and Literature in Wellesley College. Publishers, D. C. Heath & Co., Boston. The "History of German Literature" promises to be of the greatest service to students. The first book here presented, embraces the period from the beginning of German literature until 1100. The second book, to be published later, will cover the time from 1100 to 1624, and the third book that from 1624 to the present time.

Shakespeare's Richard II , with introduction and notes, by K. Deighton. MacMillan & Co., Publishers: London and New York. This is another volume by this Shakespearian author, and with the clear type and full and suggestive notes, is an excellent one for the student.

Synopsis of English and American Literature. Price, $1 20 Ginn & Co., Publishers: Boston. This is an excellent compendium of English literature, which may be used with advantage, not only by teachers and students, but by the general reader. It condenses much information in narrow limits

Tarbell's Lessons in Language. Boston: Ginn & Co., Publishers This book combines theory and practice in an admirable manner. It is the first of a series of two books, the design of which is to present as much grammar, punctuation, and composition, as the pupil can profitably study before entering a high school.

A Compendious French Grammar, by A H. Edgren, Ph. D D C. Heath & Co , Publishers: Boston. Price $1.20. This book is in two parts The first contains an elementary outline of French pronunciation and grammar, designed to enable the learner to begin reading with profit at the earliest practicable moment. The second part is intended for a more critical study of the language after reading has begun. The examples are copious, the explanations clear, and the arrangement throughout orderly and methodical.

Class-book of Geology, by Archibald Geikie, F. R. S., Director-General of the Geological Survey of the United Kingdom, etc., etc. Publishers, MacMillan & Co : London and New York. Pp. 404. Those who have studied that admirable work, Geikie's Class-book of Physical Geography, will gladly welcome the present volume. The simplicity of its arrangement, and the admirable manner in which it meets the needs of teachers and students, must win for it a great popularity, whilst its cheapness, compact form, and the entertaining style in which it is written will tend to make more general the study of geology.

BOOKS RECEIVED.

Report of the Association for the Improvement of Geometrical Teaching. Bedford, England.

First Course German Composition, by G. Eugene Fasnacht.

The Veto Power, (Harvard Historical Monographs), from Ginn & Company.

Our Government, How it grew and what it does, and how it does it; from Ginn & Company.

MacMillan's Course of German Composition, by G. Eugene Fasnacht. London: MacMillan & Co., and New York.

Exchanges.

The November *Popular Science Monthly* is above even the high average of that standard publication. Herbert Spencer opens the number with an essay on The Origin of Music. Two interesting educational articles are, My Class in Geometry, and School Life in Relation to Growth and Health.... *St. Nicholas* has completed seventeen successful years, and begins its eighteenth with the November number. .... *The Century*, for November, celebrates its 20th anniversary by an excellent number, in which there is a greater wealth than ever of illustrations.... *Wide Awake*, for November, is a good number. Miss McLeod's Acadian story, Boy Blue, of Grand Pre, is one of the most interesting of the Canadian series.... *The Cosmopolitan*, for October, is an admirable number. Its price is $2.40 a year. Published in New York.... *The Kindergarten*, Alice B. Stockham & Co , Publishers, Chicago, is a monthly magazine for parents and teachers. Price, $1.50 a year. It is very helpful for the instructors of children.... *Garden and Forest*, New York, has always something appropriate and seasonable for cultivators.... *The Herald of Health*, published by the Herald of Health Company, New York, is a valuable monthly periodical, full of excellent hints for correct living.... *The Scientific American* had, recently, a cut and description of the proposed monument to Columbus, at the Chicago World's Exposition.

"The Mother's Portfolio."

A beautiful holiday book, will be enthusiastically welcomed in thousands of homes next Christmas. Every mother needs it and every father as well, and for any teacher of little ones it is a rich treasury. It is fresh, bright, earnest, practical and wise. The illustrations and stories delight the children, while the occupations, games, music and typical lessons can be used in any home. Under its delightful method, the training of little ones ceases to be a burden, and becomes a constant joy.

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"Mother's Portfolio" is so full of good things as to defy description. It is a treasure house for mothers who have the desire and the grace to amuse, instruct and lovingly control their own children at home."

Good Housekeeping says:

"The publishers rightfully claim for this book that it is unique in its office. It is a large octavo volume of over 400 pages, with embellished covers, like a child's gift book, and as to its contents, it is a magazine of information, discussion and usefulness."

There is no better work for agents, to whom the publishers make a special offer until Christmas. One lady sold 125 copies in less than two months. With the helps furnished, an agent can make $100 before the holidays. Send at once for terms and circulars. Retail price, $2.25, expressage prepaid. Address ALICE B. STOCKHAM & Co.
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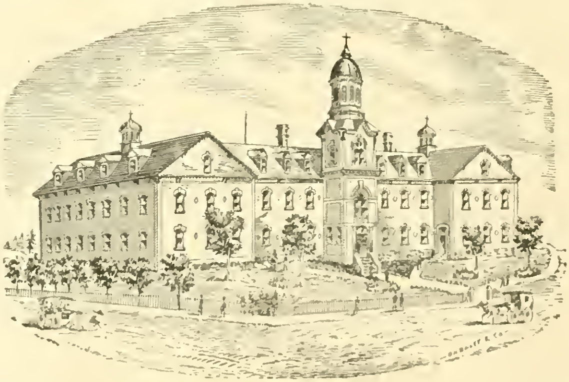

St. Francis Xavier College, - - - - Antigonish, N. S.

☞ Apply to Rector for Calendar.

MCGILL UNIVERSITY,
MONTREAL.

The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 15th. 1890).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).
FACULTY OF LAW—(Oct 1st)
MCGILL NORMAL SCHOOL—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.) J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., DECEMBER, 1890. $1.00 PER YEAR

A. H. MacKAY, B. A., B. Sc., Editor for Nova Scotia.
ALEX. ANDERSON, LL.D., Editor for P. E. Island.
G. U. HAY, Ph. B., Editor for New Brunswick.

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The REVIEW is Issued from the office of Barnes & Co., St. John, to whom subscriptions may be paid if convenient.

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The Educational Review *is published about the 10th of each month. Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

THE Annual Convention of the Nova Scotia Provincial Educational Association meets in the metropolis of the Province this time, and on the last three days of the year. The usual arrangements for reduced fares, we presume, are made. Teachers, from the whole province will, no doubt, find the occasion useful also for sight seeing and for business. The programme, printed in another column, shows that it will be one of the most important conventions of the association yet held. The array of educational talent is, indeed, an imposing one, and will attract, no doubt, a correspondingly large number of those engaged in educational work.

We take this opportunity to wish our subscribers, one and all, A Merry Christmas and A Happy New Year.

We draw attention to the advertisements in this month's issue. The REVIEW is becoming every month a more valuable advertising medium.

We are obliged to hold over several articles and communications intended for publication in this issue. Correspondents should see that their favors are sent on or before the first of the month to secure insertion in that month's issue.

OUR criticism of some possibly remediable defects in the Nova Scotian educational administration has aroused some discussion in the Halifax press; but it has done good. It shows that both parties are alive to the importance of educational matters; and of all provincial matters none is of greater moment in itself. It is *the* provincial question. The government is disposed to do the best possible; but the great difficulty in every complex matter is to rectify one evil without producing another.

WE publish in another column the first part of the excellent paper on Patriotism, read by Inspector Brydges at the Provincial Institute at Moncton. The lack of a Canadian national song, one defect referred to by Inspector Brydges, has been supplied. "My Own Canadian Home," by Mr. E. G. Nelson, of St. John, set to music by Mr. Morley McLaughlin, has the sentiment of true patriotism and has become deservedly popular. The St. Croix Soap Manufacturing Company has made a beautiful reprint of this song, and with a modesty that is as delicate as it is rare have placed their advertisement on a back page where it does not in any way offend good taste nor mar the effect produced by the beautiful title page of of the song. The company has generously presented a copy to each teacher in the dominion and to the scholars of the principal schools—nearly 100,000 copies in all.

The Executive Committee of the N. B. Educational Institute will meet at Fredericton during the last week in December.

James Hannay, Esq., author of the History of Acadia, is now engaged on a new work to be issued in February next, entitled, The Life and Times of

Sir Leonard Tilley. The book, which has been undertaken with Sir Leonard's approval, will be, practically, a history of New Brunswick for the past seventy years. Those who have read Mr. Hannay's charming History of Acadia will welcome this work from his pen.

Teachers and candidates for the teaching profession in Nova Scotia will be interested in the following notice:

Corrections.

1. The optional Latin requirement for Grade B Syllabus should read, "*Cæsar de Bell, Gall, Book* V," not *Books* IV and V as printed in *Journal of Education*.

2. The requirements in Physics (Grade B Syllabus) should read, Chapters I, II, and IV of Gage's *Elements of Physics*, and not "The first three chapters," as printed in *Journal of Education*.

Education Office. DAVID ALLISON,
Halifax, Nov. 12th, 1890. *S. of E.*

AN IMPORTANT MEETING.

The National Education Association of the United States has accepted the invitation of the Ontario Educational Department to hold its next meeting in Toronto. A note to the Review, just received from Mr. Ray Greene Huling, President of the American Institute of Instruction, states that this association has received a formal invitation to meet at Toronto with the National Association, July 13–17, 1891. There is no doubt but that the Ontario department will extend invitations to the different Provincial Institutes throughout the Dominion to be present at this notable meeting. Instead of three great educational gatherings, as outlined in the September Review, there bids fair to be only one — that at Toronto. Canada should be represented at the gathering, and in such a way as will allow our educationists to meet and, if deemed advisable, form a Canadian Educational Association. A correspondent expresses the necessity of this when he says: "Much good ought to result from such a meeting, particularly in breaking down sectional exclusiveness. Canada needs more educational unity."

N. S. NORMAL SCHOOL.

The opening of the Nova Scotia Normal School at Truro took place November 13th. Dr. Calkin, in his opening address, said he hoped the time was at hand when the work done in the Normal School shall be restricted to the more purely professional. Dr. Hall was welcomed by the students and gave a brief outline of what he had observed during a year's visit to Germany.

We were sorry to learn of the resignation of Frank H. Eaton, Esq., A. B., professor of mathematics and science in the Nova Scotia Normal School. H. G. Creelman, Esq., B. A. (Dal.), a Gilchrist scholar who has just returned from Berlin after studying for some years in Edinburgh with brilliant success, and later in Germany, has been appointed to the vacant post for the present year. The government have been fortunate in securing the services of an accomplished and experienced educationist for the permanent position in the person of A. G. MacDonald, Esq., A. M., inspector of schools for the counties of Antigonish and Guysboro. Mr. MacDonald is a graduate of St. Francis Xavier College. He took a special course at McGill University in mathematics and science, thus especially qualifying himself for a professorship in his alma mater, which position he held with distinguished success until appointed to the inspectorship. Mr. MacDonald's scholarly qualifications, his practical knowledge of the conditions of school life in the province, and his very genial manners, will ere long, we predict, make him as popular throughout the province as he has hitherto deservedly been in his eastern section.

W. H. Magee, Esq., a distinguished undergraduate (fourth year) of the University of Dalhousie, a former principal of the Digby County Academy when it was bearing off more than the average share of Munro prizes at Dalhousie, is now filling the vacant mathematical chair in the Normal School at Truro, Mr. Creelman's health not being yet sufficiently restored since his return from Berlin to make it advisable to resume work immediately.

THE METRIC SYSTEM.

We call the attention of our educational authorities and other teachers to the fact that the metric system of weights and measures is now adopted in nearly every country on the face of the earth—the majority adopting it exclusively, Great Britain, Canada and the United States permissively. In the latter countries it is coming into use in the universities, laboratories, technical schools, etc ; but in Canada no attempt has yet been made to popularize it. It has been legalized for about twenty years now in this country; and so fossilized are our old leaders of educational matters that the metrical system is deemed to be so difficult that it is kept for the high school or our higher grades of teachers, instead of being as it was intended, introduced into every school, even the primaries, and from the schools into every home. If any person pooh-poohs this, mark him. The metric names are easy, the units are convenient, and the computations are, of course, the maximum of simplicity. Every live teacher will immediately prepare for the immediate future by becoming perfectly familiar with the metric system without one term's delay. We will help you for a few months.

School Grounds.

As one approaches the village of Westfield, from Saint John, a pretty school-house on the left side of the road attracts his attention. It occupies an elevated position, overlooking the broad expanse of the Saint John, with the pretty village of Westfield in the foreground. An uncared for and neglected school-house — a too common sight unfortunately — would be a blot on this fair picture. Instead we see a well proportioned building, neatly painted, well kept grounds, and flowers in every window. A single glance from the car window as the express rushes past, is sufficient to suggest refinement — on the part of whom? Why, of all concerned: The inspector of the district, for one sees other evidences of the same character along this route; of the trustees, for they have become interested and supplied the funds to meet the expense; of the teacher, for the same swift glance shows a touch here and there that has been put on and kept up day by day as good taste and an eye to pleasant surroundings would suggest.

We welcome the promise that such evidence as the above affords, of a time when an uncared for and shabby school-house will be reckoned a disgrace to the district that maintains it. Arbor day is doing much to bring about a better state of things; but arbor day, unfortunately, in some sections is only one day, a day when a good deal of sentiment is wasted in speeches and recitations, but the old rut is dropped into the following day to be pursued till another arbor day comes round when the same farce of speeches and recitations, planting trees to remain uncared for, will be enacted over again.

But the most indifferent cannot long remain unaffected when there is a steady increase of well kept and tastefully ornamented school grounds. Teachers, school officers and school children will follow the example that is beginning to be set and the influence will extend to whole communities.

LITTELL'S LIVING AGE FOR 1891.—For nearly fifty years this standard weekly magazine has afforded to its readers the most convenient and satisfactory means of keeping abreast with the best literature of the times. With the constant growth of this literature, the importance of *The Living Age* has steadily increased. It is unrivalled in its field, and is invaluable to every one who, in these busy times wishes to keep pace with the literary and scientific progress of the age. Its prospectus for 1891 is well worth attention in selecting one's reading-matter for the new year. Reduced clubbing-rates with other periodicals are given, and to new subscribers remitting now for the year 1891 the intervening numbers are sent *gratis*. Littell & Co., Boston, are the publishers.

FERNDALE SCHOOL.

WORLD WEIGHTS AND MEASURES.

> Take thy balance, if thou be so wise,
> And weigh the wind that under heaven doth blow;
> Or weigh the light that in the east doth rise;
> Or weigh the thought that from man's mind doth flow.
>
> SPENSER.—*Færie Queen*, Bk. V., Cant. II., st. 43.

I.

T. Are your "reduction" tables of weights and measures used in every country in the world?

S. In English countries they are, I should think.

T. Had the English people more than one table for the same kind of weight or measure?

S. Yes; even yet we have Troy, Apothecary and Avoirdupois weight in our tables, not to mention long and short avoirdupois.

AN. S. And lineal, and cloth measure, not to mention the different kinds of cloth measures that used to be, English ells, Flemish ells, etc.

AN. S. And Dollars, and Pounds, Shillings, Pence, and Farthings, and Crowns and Guineas, etc.

T. Very true; and every other country had about as many varieties of its own kind, which made calculations for commercial people far more laborious than it otherwise would be.

S. And for the scholars in school, too?

T. Of course. We want two things, then. 1st, one set of tables for every country in the world; 2nd, the simplest possible kind of tables. It might be best to take the size of the world to give a starting point for a common measure for the use of the world.

S. It would be a very big measure, would it not?

T. Yes; but it should suit a Frenchman, a Russian or German, as well as an Englishman. You can call the system an English one on that plea. The Frenchman will call it French on the plea of priority of invention; and most of the other nations of the world can call it by their own name on the plea of its adoption and use.

S. And why have we not the system?

T. We have in law, although not in use. In 1864 — the year of the introduction of our free school system in Nova Scotia — this system was made legal in Great Britain, as well as the common Imperial system which we generally use yet in Canada.

S. And is the new system legal in Canada?

T. Yes; for about twenty years. Don't you think it is about time we should commence to make the system popular?

S. Yes; it should have been done twenty years ago. But how do they take the world itself as the basis of the new system?

T. In 1799 a very accurate series of measurements to determine the circumference of the world was completed. It was found that a long pace, nearly four inches longer than our yard, repeated 40,000,000 times, would circle the world. That is, the distance from the equator to the pole would contain 10,000,000 of these long steps. This long step we name *meter*, from the Greek word *metron*, "a measure." The meter is, therefore, the *unit* of the new system. Now, who will tell me how many meters in a quadrant of the earth — that is —

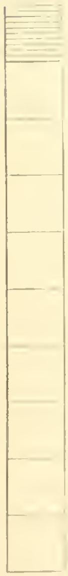
S. A quarter of the earth's circumference — 10,000,000.

T. Now, I mark the length of the meter on the board, and also on the floor. See if you can step a meter, from toe to toe, or from heel to heel.

(Several try.)

T. Now, I give you an exercise for to-morrow. Practise stepping meters. I will examine you in this way. I will take you a distance from the school house and ask each one to judge the number of meters he is distant from the building. I will record your estimates, then measure the number of meters. I will give 100 marks to any one not one meter astray; take two points for an error of *one* meter, four for an error of *two*, etc. Now, we shall see who will come off best.

II.



Decimeter divided into centimeters, and one centimeter divided into millemeters.

T. To-day we take up the sub-divisions of the meter. I see quite a number of you can step a meter pretty accurately. How many such steps will go around the world?

Chorus. 40,000,000.

T. Now here we have a tenth of a meter. Each one must take home with him an accurate copy of it. Ten of them will make a meter. Now, if I give you the fraction ·1, what would you call it?

S. A decimal.

T. What do you mean by that?

S. That the digit coming after the decimal point means tenths of a unit; a figure in the next place a tenth of a tenth and so on.

T. You have nothing new to learn then. *Deci* always means a tenth in this system. What might we call this measure, then?

S. Decimeter.

T. Correct. The meter is a natural measure. You found it to be a convenient length for pacing. Is the decimeter a convenient unit for any purpose?

S. Yes; it is about the breadth of the palm of the hand.

T. That depends on its size, of course. But you are quite right. "Palm" and "hand" were old units of measurement,—very convenient for rough estimations. So is the decimeter—it is an approximate hand-breadth. Now let us estimate how many decimeters high this desk is—this blackboard—this room? (All join in estimating.)

T. What do we call the hundredth part of a dollar?

S. A cent.

T. Join the word with an *i* to meter as in our last case, and what shall we have?

S. Centimeter.

T. Very good. The centimeter is the tenth part of ——

S. Of a decimeter.

T. Will it make a convenient natural unit?

S. Yes; it is about the breadth of the little finger.

T. Very good. The top of the little finger comes pretty near it. How many centimeters long is this pencil—that one, etc.

(All join in estimating).

T. What is the tenth part of a cent?

S. A mill. The tenth part of a centimeter would therefore be a *millimeter*, I suppose?

T. Quite correct. I see you have nothing exactly new to learn in these words. Can you find any convenient natural measure nearly a millimeter?

S. The thickness of a stout thumb nail.

Another S. Nearly the thickness of a new ten cent piece.

T. Supposing a ten cent piece to be one millimeter in thickness, how many form a pile one meter high?

S. 1,000.

T. How many ten cent pieces in a rod of silver of the diameter of a ten cent piece which would encircle the world?

S. 40,000,000,000.

T. Measure the length of the school room.

S. (Measuring.) Nine meters, seven decimeters, three centimeters, and eight millimeters.

T. Can it not be written down more shortly.

S. Yes; 9·738.

T. Very good; that is a good illustration of the neat way in which our new measure can express lengths. A mile is equal to 1609·315 meters. Read this,—not as a decimal.

S. Sixteen hundred and nine meters, three decimeters, one centimeter, five millimeters.

T. Is it necessary to read the number this way?

S. No; it might be read in meters and decimals.

T. Well, I expect each one of you to take these measures home with you, and to make measures equal to them to be used for measuring things about the house or farm. We will soon then have plenty to buy cheaply at the store,—when it is found people want them.

Astronomical Notes.

On Christmas morning three years ago, from an hour before sunrise until an hour or more after it, there was many an eye turned towards a beautiful star which shone above the south-eastern horizon. On Christmas morning this year the same beautiful star may be seen shining above the same quarter of the horizon. Three years ago people called it the star of Bethlehem. Perhaps they will call it that this year also. Perhaps it was the star of Bethlehem. Flammarion thinks this is the best of the various hypothesis that have been made on that famous star.

Star of Bethlehem or not, it is a beautiful star, the most beautiful we ever see in the heavens. Homer paid it the same compliment in his time. It is as evening star that he speaks of it; but, perhaps, it looks even lovelier in the morning sky. See Maud's lover's description of it in his "Come into the garden" song.

You may see it in the morning sky even before Christmas. Its brilliancy is increasing, and will continue to increase for a fortnight after Christmas. Then it will gradually become less bright, but will continue bright enough to be seen in full daylight for several months.

Mercury is evening star now, and at the end of the month he will be brighter than he has been as evening star since April last. But he is not nearly so well placed for observation as he was then — too far south and too near the horizon.

Mars and Jupiter are still the most conspicuous objects during the early evening. Their conjunction on November 13 must have been a fine sight. Here the evening was cloudy, and not a glimpse of the planets was to be had. I fully expected this; for, ever since I began writing astronomical notes for the Review, the evenings have been cloudy or foggy whenever anything particularly interesting was going on in the heavens. It was not so before.

Jupiter will be evening star until the middle of February, and may be seen in the southwest after sunset until within a month or so of that time.

Mars is speeding eastwards among the stars so much faster than Jupiter that the sun won't overtake him until the end of next July; and he will be evening star until that time. But he is no longer the splendid object he was during the summer and autumn. His brightness now is just about the tenth of what it was in June. It is still decreasing, and by the end of his evening star season will be only a fourth of what it is now.

Saturn has been a morning star since the end of August, and will be so until the beginning of March. But in the middle of December he may be seen about an hour before midnight, and at the end of the month he will rise about 10, a little to the north of east. He is in the eastern end of Leo.

Uranus is a morning star, and not worth looking for at present.

Neptune is worth looking for, if for nothing else than to be able to say that you have seen this farthest off member of the solar system; and this month and the next three will be a very good time to look for him. He is in Taurus, between Aldebaran and the Pleiads; more precisely, between Epsilon Tauri and the eastern Omega, a little to the right of the middle of a line joining these two stars. But you'll never find Neptune from this. What you want — besides your field glass — is an almanac, a star-map, some patience, and some judgment. As Neptune shifts his place among the stars very slowly, it is not easy to pick him out from among the 8th and 9th magnitude stars near him, but once picked out it is quite an easy matter to hold him and follow him for the four or five months that he remains in the evening sky. Here are his positions for December 15, January 1, and January 15:

Dec. 15,	R. A., 4h 13.1m.	Decl. N. 19d 29m.
Jan. 1,	4 11.4	19 25
Jan. 15,	4 10.3	19 23

He's retrogading at present, you see — moving to the right. He will continue this motion until Feb. 13. For a week or two about that time you will hardly be able to detect any motion at all in him. When you do next detect it you will find that he is moving to the left. In the middle of March he will be back to his place for January 15, but a little farther north.

* * * *

In the September Review there was a short description of the heavens as they appear to a place in north latitude 45 degrees at XXI. o'clock sidereal time. On September 20 this hour coincided very nearly with 9 p m. mean time. On December 20 it will coincide very nearly with 3 p. m. At 3 p. m. on December 20 the same stars and constellations will be above our horizon as were above it at 9 p. m. September 20, and they will occupy the same positions By the time 9 p. m. comes round on December 20 there will be some change. It will then be III. o'clock sidereal time.

Let us compare the heavens at III. with what they showed at XXI.

Of the brightest stars we saw at XXI., Arcturus, Altair and Fomalhaut have gone; and of the constellations — Corona, Hercules, Ophiuchus, Aquila, Sagittarius and Capricornus. All the others mentioned in the September article are still above the horizon, but in different positions. You should look them all up and exercise your eyes and your understandings in recognizing them in their new positions. Above all don't fail to look at Cygnus. There is something about it that looks more striking at III. than at any other sidereal hour. What it is you will see when you look. And don't run away with the notion that 9 p. m. December 20, is the only time when you can see the heavens as they are at III. This hour, like every other sidereal hour, comes round once every day — twice a day sometimes — III. usually does so on Guy Fawkes' day: it did so this year. A week *before* December 20 the hour III. will fall half an hour *after* 9, a week *after* December 20 half an hour *before* 9, and so on.

Now look at the new objects that have come in sight between XXI. and III. At XXI. the Pleiads were above the north-east horizon. At III. they are nearly on the meridian, just a little east of it, and about two-thirds of the way from the horizon to the zenith. There was a map of, and an article on this group in the Review for January, 1890. Below and to the left of the Pleiads is a bright red star named Aldebaran. It is one of a cluster called the Hyades; they form the letter V. Aldebaran is at the end of one leg of the V, the star at the end of the other is Epsilon Tauri. Between Epsilon and the Pleiads you may see — if the moon is not too near — two small stars dividing the space into three not quite equal parts. The one of these nearest to Epsilon is Omega. It is between Epsilon and Omega that Neptune is at present.

A line from the Pleiads down through Aldebaran will bring you to Orion. If you don't know him already, note the three stars close together and nearly in line with Aldebaran. That's Orion's belt. Above this are two bright stars, one of them red, and of the first magnitude. This one is Alpha Orionis. Below the belt are two other stars forming a quadrilateral with the other two. One of these is also of the first magnitude. It is Beta Orionis, still better known as Rigel. Run your glass down the row of small stars hanging below the belt and you will see Orion's famous nebula. Orion is far too grand an object to be disposed of in a mere paragraph. Perhaps next month or the month after he may get an article all to himself.

Below Orion, and in line with his belt, you will find the brightest of all the stars. It has several names. One is Sirius, another the Dog Star, another Alpha Canis Majoris. Like Orion it deserves a whole article, and may some day get it.

Round towards the east and higher up than Sirius is the little Dog Star, also called Alpha Canis Minoris. Another of its names is Procyon, Greek for "before the dog," so-called because in Greece as in Canada it rises before the Dog Star. To the south of north latitude 25 degrees Procyon rises after Sirius.

Procyon, Sirius and Alpha Orionis make a large equilateral triangle.

The twins, Castor and Pollux, lie farther east than Procyon and higher up — about half-way between Capella and the east point of the horizon. Capella was one of our XXI. hour objects; at III. it is high up, the brightest star to the east of the zenith. Of the twins the lower and brighter one is Pollux, the other is Castor.

Half-way between Pollux and a point or so north of east try if you can see what looks like a patch of light cloud. Put your glass on it and you will see a beautiful cluster of small stars. It is called Præsepe, the Manger, the Crib, the Bee-hive.

A little farther north the Sickle is rising. It is in the head of the Lion. A couple of hours later, when he has pulled his hind quarters above the horizon, you will see Saturn. A. Cameron.

Yarmouth, N. S.

Suggestions for the Public School Course.

We have received the following letter from one who has had the most successful experience, both as a teacher and as an inspector, in Nova Scotia. It was probably not meant for publication; but the suggestions are so definite and so worthy of consideration, that we feel it should be placed before our readers. Whatever effect it may have will certainly be in the direction of improvement:

"I see by the Educational Review that the revised course of study will soon be ready. Is it too late to make a suggestion? I think a systematic course of mental arithmetic should have a place in the next course. McLellan's Mental Arithmetic, Part I., distributed among 7 or 8 grades would serve a most desirable purpose both from a utilitarian and intellectual standpoint. How would this division do? Grade II. from page 9 to p. 23. Grade III. from p. 23 to p. 38. Also practice in Reduction tables of grade at pages 89, 90 and 91. Grade IV. from p. 38 to p. 47. Also from p. 51 to p. 54. Reduction tables of grade at pp. 92, 93, 94 and 95. Grade V. from p. 47 to p. 51. Also from p. 85 to p. 97. Grade VI. from p. 55 to p. 74. Grade VII. from p. 74 to p. 86. Also p. 97 to p. 105. Grade VIII. from p. 105 to the end of the book. I believe if mental arithmetic were made authoritative in the way I have indicated, the result would be a great improvement in the study of arithmetic generally. When left to teachers, if mental arithmetic is taught at all, too often the questions are feeble, and are repeated without much variation. What is going to be recommended in the way of geography? It is terrible to think that every child in Nova Scotia that has run the blockade of scarlet fever, measles, etc., must at last be confronted with that tremendous book called "Calkin's Geography." To see little children poring over that book a long winter evening is a heart-rending sight. What we want is a book of maps, from which everything should be learned with the help of some questions in connection with each map in order to give the child some idea of what he should learn from it. This is my opinion, and I know what I am talking about. I wish you would take an interest in these two matters, notably the arithmetic. McLellan's, Part II., might be used in the high school course."

Notes for Teaching Music by the Tonic Sol-fa Notation.

Tenth Paper.

In former papers we have looked upon Doh as the ruling tone, and the Doh chord as the most important chord, supported on the one side by the similar chord Soh, and on the other side by the similar chord Fah. All these three are major chords, *i. e.*, the lower third in each is a major third, or two whole tones.

Prominence may be given to almost any other note of the scale, by frequent repetition, by being put in the strong pulse of the measure, and at the beginning and end of the composition in cadences, and by the way in which it is approached. The music would then take character from this prominent tone and be bold, or bright and cheerful, or solemn almost to sadness, or rousing, or sad even to weeping. By exercises of this nature the teacher can more fully and strongly develop the mental effect of the different notes of the scale in his modulator exercises.

The Ray, or more correctly the Rah Mode, was formerly much in use, but because, according to the modern rules, the harmony in this minor mode the chords are somewhat harsh, this mode has fallen nearly out of use. The only two modes much used now are the Doh Mode and the Lah Mode. When the music passes in one piece from the one mode to the other in Tonic Sol-Fa Notation, we call this modulation, and the term Transition is applied to the change from one key to another. In the Lah Mode it will be felt that some of the notes of the scale change their character. The d loses some of its restfulness and firmness. The l becomes less expectant, more restful, though even sadder than before. The note m, its fifth above, seems to increase this mournful effect of l, and itself to become grander and more important as the fifth of the new tonic lah. When we look at the L chord in the scale we see that it and its more closely related chords M and R have each a minor third, *i. e.*, three semi-tones at the bottom; and a major third, or two whole tones above. These two chords have the same relation to Lah and its chord as the chords S and F have to Doh. The tone lah obtains an additional importance when it has a leading tone given it like Te leading up to Doh. This leading tone is the sharp of S, and called Se. We now find an awkward interval between f and se. This is sometimes removed by sharpening fah. This new note, except in certain phrases, is not named fe but ba, and is pronounced bay. In looking to the modulator it will be seen that the intervals m ba se l correspond with those of s l t d^1 in the scale two removes to the right, and this may help to the singing correctly of these tones. The teacher cannot so easily teach the minor mode as on the modulator. By using it largely, and gradually bringing in these changes, the pupils will experience very little difficulty. It will be noticed that even when these new tones are not introduced that the notes f, and more particularly s, disappear from the minor phrases, and where they are introduced they are more difficult to sing. In preparing for the minor mode the teacher should give prominence to the notes of the L chord into his modulator exercises. Next let him begin with major mode phrases, and then let him, without giving any notice of the fact, pass into the Lah Mode and ask the class if they observed any change in the character of the music. He may ask which notes helped most to give this effect. The answer will be l and m, and the phrases l t d^1, d^1t l, m l and l m.

When these minor exercises become quite familiar, the new tones se, and after ba, may be gradually introduced in easy phrases, and they will give little difficulty. The teacher may point on the modulator exercises like the following:

No. 1.

d m f s s l s f m m l t d^1 t l m r d t^1 l_1.

No. 2.

s m f s d^1 t l s m l d^1 t l m r d r m l.

No. 3.

m_1 l_1 t_1 d r m:—:— d r m f s m:—:—t_1 d r m f

s t_1 d f m:—: r:—d:—:—d m m m m r:—:—

d:—:—d m m m m r :—:--dt lt d r m l se :—:—

M_1 l_1t_1 d r m r m f m r d:—t_1:—l_1:—:—

(Heb. Mel-Leoni.)

James Anderson.

For the Review.]

Temperance.

I will take advantage of the subscriber's privilege, and claim a place in your valuable paper in which to express a few opinions on the importance of teaching temperance in our public schools. I have always given this subject a good deal of time and attention in all the schools in which I have taught, numbering five.

In each of my schools I organized a temperance society, and succeeded in getting all my boys and girls to sign a little temperance pledge. I have had the satisfaction of knowing since that the signing of that little school temperance pledge has kept my boys in many cases from yielding to the temptation of taking the first glass of liquor, and thus they are growing up to be temperate young men.

At our Kings County, N. B., teachers' institute, the opinion was expressed that we should not teach temperance in schools other than from a scientific standpoint. I cannot agree with that statement at all, and I do hope that few, if any, of the teachers of New Brunswick do. I have always been able to make deeper and more lasting impressions upon my scholars by teaching it from a moral standpoint. I think that our instructions should be based upon science, but that we should endeavor in every possible way to teach our boys that they cannot afford to use intoxicants at all, and to lead them to hate intemperance.

I always have and always will teach my boys that the faculties which God gave them, and which should be developed and educated so as to form the character of the noble man, were never intended to be ruined by the use of intoxicants. Also that intemperance is the enemy to wealth, honor, social and moral happiness; and that the man who becomes a drunkard must forfeit all of these, and get in return the drunkard's reward in life and in death. I cannot see how any honest teacher can help teaching temperance in their school from a moral standpoint. I would make very little effort to reform a drunkard, but would make any sacrifice to help to keep our boys temperate and pure from the polution of intemperance; and would, therefore, ask all fellow-teachers to help save our boys. I consider that in the present age every Christian man and woman should be a worker in the temperance cause, and that there is not and could not be any better field for labor than the school room. The boys are at the age when they are most easily influenced either for good or bad, and that more lasting work can be done for the temperance cause then than at any other time. I feel sure that all the mothers, wives, sisters and daughters of drunkards, either moderate or inveterate, will agree with me in the opinions I have tried to express.

Again, I feel sure that when I have all of these to agree with me I have a large majority of the female sex.

I hope you will pardon me for making my remarks so lengthy, as I am very much interested in temperance, and could not resist the inclination to have a conversation with the other teachers through the EDUCATIONAL REVIEW. JENNIE H. HANSON.

St. John, N. B.

To separate the leaves of charred books, a French official has devised the following means: Cut off the back of the charred book so as to render the leaves absolutely independent from one another, then soak them, and dry them rapidly by a current of hot air. The leaves will then separate, but must, of course, be handled with extreme care.

For the REVIEW.]

Book Knowledge Indispensable.

Apropos of Dr. Hall's very interesting remarks on the "German Schools": Though the plan of educating the child through the senses, and of allowing him the free exercise of those senses in the most natural way, viz., in the open air, must commend itself to every teacher, yet, I think, he will require no inconsiderable amount of book-learning to enable him to "write down his observations."

He may dispense with the third "R," but he must have an elementary knowledge of grammar in order that he may express his ideas with some degree of accuracy. To this end he must have spent at least *four years* in our "bookish schools," and then he will be an exceptionally bright pupil if he finds his task an easy one.

The foregoing is especially applicable to a district like this, where English is very imperfectly spoken, and the children have virtually to be taught a new language. A LADY TEACHER.

Northumberland County, N. B.

For the REVIEW].

Teachers' Work.

I think country schools are the most difficult in which to introduce the whole course of instruction. This can probably be traced to a twofold reason.

In many districts the trustees are chosen from the most wealthy men, in order to be economical in point of teachers' salaries, and who do not take an interest in the school, as in many cases they have no children. In other districts the trustees are those who know nothing about the minor subjects to be taught in the schools, and, therefore, think they should be conducted as in their school-days.

In these cases the teacher finds it difficult work to run the school with the course laid down.

The teacher must in some way convince parents that it is for the welfare of their children to follow the studies laid down in the school law. How is this to be done? Could there not be a day set, say once a month, on which the parents are invited to drop into the school-room to see the different work their children are doing?

I presume there is no district but that there is some parent or other person who would respond to the invitation. Let the teacher have some special work prepared, and while exhibiting it, explain how important a place it takes in the scholars' education, letting fall at the same time a few hints how beneficial it would be to the parent to call and see for themselves what is going on in the school. There are many persons who would be glad to say to a neighbor that they had visited the school, and remark how well they had been received by the teacher, and what pains had been taken to explain the workings of the school. When parents become acquainted, and understand why the objectionable subjects are taught, the prejudice soon wears away, and the teacher can with less difficulty introduce these subjects among the pupils, who will soon take an interest in the exercises when they have their parents' approval. Some may think their work is thus increased, but the live, earnest teacher will work only for the benefit of the school. A. B.

Queens County, N. B.

For the REVIEW.]

A New Snake Find.

To the student of nature the distribution of wild animals is always a matter of interest, even though the forms observed are those of a race so generally despised as that of serpents. It is for this reason that I venture to say a few words with regard to the recent discovery here of a snake which, so far as I have been able to learn, is new to our fauna.

The stranger was observed by me about a fortnight or three weeks ago as I was descending from my daily duties on "College hill," and was at the time making rapid progress across the carriage-way leading to the University. After some little coaxing he was induced, not knowing the fate which awaited him, to enter a small bottle placed conveniently before him; and notwithstanding the strong temperance sentiment in Fredericton, was soon treated to a draught of spirits of wine. As with all immoderate drinkers he eventually succumbed to its influence, and, upon being taken out for post mortem examination and identification, was, as I supposed, found to bear the appellation of the "Little Red Snake," *Calamaria amoena*, Holbrook.

In length it was about six inches and remarkable for the shortness and abruptness of the tail; while as to color, the lower surface or belly was a rich copper red, the back being also reddish, but darker, and with a shade of brown. The history of his relatives being sought (in the Natural History of New York), it was found that the range of the species is from New Hampshire to New Jersey. How, then, did our friend get here? The place in which he was found was only a few yards from the track of the Fredericton Railway. Can it be that he is a *stowaway*, who had come across the line by rail, dodging the keen-eyed officials at Vanceboro? It may help to throw light upon the question to know whether any specimens of a like kind have ever been observed here, and it is with a view to obtain information upon this point that I now address your numerous readers. Has any one of them ever met this "Red-skin" within the limits of New Brunswick or Nova Scotia?

L. W. BAILEY.

University of New Brunswick, Fredericton.

Later advices from the Museum of Comparative Zoology at Cambridge, indicate that my little captive, sent on for identification, is *not*, as was at first supposed, *Calamaria amoena*, but a closely resembling form known as *Storeria occipito-maculata*, the name having reference probably to two little pale spots behind the head, by which, together with some other characters, the species is distinguished.

Though the discovery here of this snake is less important than would have been that of *Calamaria amoena*, it is still one of some interest, as the first named species has not hitherto been reported north of Portland, Me. It is, however, probably a true British subject and not a mere tramp, as at first supposed. Its occurrence here was to be expected while that of *Calamaria* was not.

Kindergarten Methods in Primary Schools.

THIRD PAPER.

In the third lesson, on the cube of the second gift, we emphasize the fact that the cube has *six faces*. A cube is given to each, and questions are asked in review of what they already know, as, "Is it round," etc. Ask of one pupil, Has your cube one face? This will occupy the attention of all, and a ball may be brought and compared. What kind of a face has your cube? How many faces has it? Count the faces by opposites, with all pointing as you count; top, 1; bottom, 2; back, 3; front, 4; right, 5; left, 6. Ask them to think of something with six faces or sides. One child thinks of a box, and one is brought from the desk, and she holds it while we all count. It has six faces. Is it a cube because it has six faces? There is a difference of opinion here, and perhaps we better leave it until another day when we know about *square* faces. Simply tell them to think about it until another day. One more observing remarks that the faces of the box are not the same size, and here we turn the attention to what our cubes can do. Can yours roll? Why not? What can it do? It can stand. Is there anything else it can do? It will slide. The ball can roll, but the cube cannot roll. They are opposites. We finish this lesson by counting cubes in sixes as they are put away. Most of the little ones can count five fingers on one hand and one more is easily grasped.

Next day the *sharp corners* of the cube are taken up. Recall the round and flat faces of previous lesson, and touch faces of objects in room, describing them. Has the cube any other part besides faces? Yes. Take it in one hand and grasp it firmly. It has parts that stick into our hand. What do you call them? They are sharp places or corners. Count the corners of the top face and also of the bottom face. How many corners has each? Four. Two fours are how many? Have individual and simultaneous counting of corners until all know there are eight. Find corners of objects in the room? Compare outside and inside corners. Some corners are dull and some are sharp. Has the sphere any corners? No. Perhaps some one will say: "It has only one face and so there is no place for a corner, no face to meet that one.

Another day we dwell on the *round and straight edges* of objects, and we distribute to each a sphere, cube, and ring. (In the Kindergarten the ninth gift consists of steel rings of different sizes.) We begin our lesson always by reviewing what has already been taught, and to-day we want to find out something more about our cube. Let us look closely at this cube and see if there are any other parts besides faces and corners. Yes, there are. What do you call them? Perhaps some will know and others may not. One little girl said: "If you call the sides faces, then there must be arms;" and once another child called the corners "elbows;" so, we see they are not all familiar with the word *edges*. Let us look for a part, like those we are speaking of, somewhere else. Has the table any? Yes; look around the room and find some others. Several are found, and one child is directed to put her hand on one face, and another puts her hand on another face, and they move their hands slowly towards each other till they meet. Each pupil sees that the part we are talking about is where the two faces meet. If no one knows the word edge we tell them, and give the name. Then we find edges which go in the same direction as those of the cube from top to bottom, or from left to right. Compare the edges of your cube with the edges of the block (cylinder) which I am holding. Why, its edges go round! Find round edges in the room? Do the edges of cube and desk go round? No. They go from left to right and from back to front. Take a piece of cord, put it through the centre of a cube and hold the ends so that the cord will be straight, then hold the cord so it will be curved. The opposites, curved and straight, are seen at once. We then find straight and round edges of objects in the room, and at the close draw pictures of straight and round edges on the blackboard.

(To be continued.)

For the REVIEW.]

"The Missing Link."

THE MISSING LINK, OR THE CONTINUATION OF THE THREE-FOLD DEVELOPMENT OF THE CHILD FROM KINDERGARTEN TO THE MANUAL-LABOR SCHOOL. Emma Marwedel. D. C. Heath & Co., Boston, New York, and Chicago, with two plates illustrating directions given in text. Manual training in the educational centres of Europe and America is not only holding its own in the Kindergarten proper, and progressing in special schools for industrial training, but it is also gaining a recognized place in many collegiate institutions hitherto solely devoted to intellectual pursuits.

As Kindergarten departments come into operation as a necessary part of the public school system, they will, from their very nature, and the success attending their methods, force upon educators the necessity of carrying on in the succeeding grades the manual training which is so marked a feature in Frœbel's system. The law of development, which requires uninterrupted continuity, imperatively demands this. But in order to achieve success great care will be required as to the choice of materials, tools and the course of instruction. Both tools and materials must be within easy reach and inexpensive; the former must lend themselves freely to the child's slender strength. The course of instruction must also be such as to stimulate the free inventiveness of the child; to produce a love of work for its own sake, and cultivate the ability to express in outward forms, created by his own clever fingers, the thoughts and feelings of his heart and mind. All mere imitation must be ruled out, and originality should be encouraged, even although it should express itself in a crude, or even in an uncouth manner.

Miss Marwedel, in the book before us, has indicated the path, and also the means of following it, to those who would carry on in the intermediate departments the sense-education and training in manual dexterity so well begun in the Kindergarten, and in those primary schools where, happily, the teacher is in sympathy with Frœbel's philosophy. Miss Marwedel's German thoroughness and great practical experience in American Kindergartens, together with the respectful recognition of her services to the cause of child-culture by distinguished educationists, who cordially endorse her exposition and application of Frœbel's ideas, should ensure a favorable reception for this book from parents and teachers. Miss Marwedel's "circular drawing," which has been before the public for sufficient time to test its merits, has been adopted by the authorities in Chicago and Philadelphia, and forms an admirable preparation and accompaniment to this little work. Our object in bringing this "Missing Link" to the notice of teachers and parents is with the hope of inducing them to look carefully into a subject which has not yet engaged their serious attention. To the readers of the EDUCATIONAL REVIEW we commend the study of Dr. Birch-Hirschfelder's lecture "on the value of instruction in manual dexterity as regards bodily development and hygiene," of which Miss Marwedel gives an excellent abstract. Every sentence is weighty. The brief account of manual labor reform in Germany is valuable because the writer speaks from personal experience and inspection of the movement in several great centres.

In closing let us remark that the labor reformers are divided into two distinct classes, those who, as in Russia, advocate reform as rendering the laborer more intelligent, and, therefore, a better producer. This wing has a following in England and other parts of Europe, but while many of the defenders of this theory are very able, and, as far as they go, are doing much good, they miss the point of genuine education — the harmonious development of the individual in every part of his being. The other class, while fully alive to the material advantages of industrial training, look upon it as the means to an end. The culture of the body, the sharpening of the senses, the cerebration of the fingers, the strengthening and refining of the intellectual powers, the stirring of the imagination and æsthetic faculty, whereby the common, every-day life of the poorest may glow in the beauty that blind eyes never see, nor dull hearts feel, but which sinks deeply and sweetly into the soul, rendered sensitive by a wise training. Such are the aims of the progessive labor reformers of our day. Are they not worthy aims? The upbuilding of character; the development of manhood. C.

Halifax, N S.

Patriotism—How Can it be Developed in Our Common Schools?

By INSPECTOR BRYDGES, A. M.

Read before the Provincial Teachers' Institute, Moncton, June, 1890.

If anyone were to consult our Manual of School Law it would be found, under a regulation embodying the duties of teachers, that it is the duty of the teacher to give instruction as occasion may require to the school concerning loyalty and love of country. The subject which we have under discussion—and just here I might mention that it was not chosen by me but was placed in my hands by the executive commitee of the Institute—seems to imply that the sentiment does not receive a fair attention at the hands of the teacher, and it is not at present being developed in the common school. Now no one for an instant would question the patriotic feelings which exist in the minds of the 1,600 or more teachers of this province; in fact I think we take pride in considering ourselves as patriotic as any profession in our country, and if a proper knowledge of the history and of the great resources of this land is necessary then surely the teacher stands first in cherishing this sentiment of love of country. And I believe that teachers, or at least the large majority of them, are doing good work in stimulating patriotic feelings in the minds of the pupils under their care.

But, as I take it, the object of these papers read before this Institute is to renew within our minds our duties, to quicken us to a lively sense of them, and also to promote healthy discussion. Nobody expects the teachers to place this subject in the time-table, and devote a portion of each week in reading essays to the pupils upon love of country; or to take the word patriotism as the key-note of a lesson to be given on certain occasions I, for my part, would be the last one to do any thing to increase the already lengthened chain of obligations that press almost too heavily upon the teachers of our province

It is in connection with, and by means of subjects already in our curriculum — such as reading, composition, and emphatically history and geography,— that we are to accomplish the object set forth in the title of this paper, and if I am able to point out or show how, by treating these or other branches of school work as a medium by which the teacher may introduce this subject to the careful attention of the pupil, I shall have accomplished some part of my object. Now it might be asked here how *soon* this subject could be introduced with any degree of success, *i. e.*, in what standard of our course. Whatever faculty of the mind leads a child to love its own home and parents and prefer their own to all others, that very same will teach the young pupil to love his own country and prefer it to all others. Place a boy from the United States in one of our schools, and how soon the others will call him a Yankee. Just as soon as a pupil begins to learn concerning his country, he should know that it is *his own* in distinction with others.

A great deal has been done lately to stimulate pupils in this direction in the observance of Arbor Day. Trees have been set out in honour of our Queen, the Governor General and the statesmen of Canada, thus calling their attention to their country. More yet remains to be done. As the number of trees set out lately has been many less than formerly, the decoration of the interior of school rooms is coming in order; and if in connection with these decorations such mottoes as "Canada, our native land," and "For God and home and native land" were placed upon the walls of the school room, the effect would undoubtedly be good.

For the pupils to be able to fully appreciate the degree of civil and religious liberty which we enjoy in our country, and to have developed within their minds a true patriotic spirit, it is absolutely necessary to possess a good general knowledge of British and Canadian history. The people of Canada are largely, directly or indirectly, of English, Scotch, or Irish descent It is right then that the children of these people who are united in our country by common interests, by pursuing the same calling in life, and by a general and growing desire for the development of the resources of our land, as *closely* as the crosses on the flag that floats above our public buildings are knit together, should receive accurate instruction in the history of the mother country. It is through this history that they are to learn of the struggles of their ancestors for freedom, beginning with Magna Charta in King John's reign, down through the Tudor and Stuart periods, and only ending in the present century. And here it would be proper for the teacher to bring to the pupil's notice the existing state of affairs in other countries, the despotism that continues in force in Russia, the military tyranny in Germany and other nations. It is through a knowledge of the tyranny and despotism that rule with the iron rod in other countries that we properly appreciate our own freedom. British history must always receive its proper attention in our schools.

When we consider that Canadian history was first introduced into our public schools as late as 1874, and that previous to that date nothing was taught concerning our native country, surely everyone is ready to concede that our schools have made great progress in this study. Where formerly Wolfe and Montcalm and the Landing of the Loyalists were fast becoming traditions, and the successful struggle for responsible government might soon have been less, now every pupil that passes through our common schools has some idea of the early settling of the country, of the wars between French and English, the contest of 1812–14, the struggle for responsible government and the Act of Confederation. Here the history of the provinces unite into that of the Dominion. The statesmen through whose influence and by whose efforts this Dominion was formed, when they met together in Ottawa in December, 1869, stood upon the threshold of a *new era in the history* of half the North American continent. Only twenty-three years ha ve passed by, but during that timegreat strides have been made in the development of Canada. Railroads have been projected into countries which a few years ago were considered but a howling wilderness, and the resources of the country, which I will have occasion to speak of hereafter, as well as the efforts put forth for their development, are only beginning to be appreciated.

Along with the subject of history in our curriculum is placed that of civil government. Not enough attention is devoted to this in our schools; it is like entering the thin edge of our subject, and yet some of our schools are but indifferently informed in this particular.

As the pupil in ungraded schools learns the parishes into which his native county is divided, he might be told how each parish elect representatives to the county council, and later on in the course they should know how often they are elected, who have votes in the election, what their presiding officers are called, and what are the duties they have to discharge. — that they pass acts referring only to the county which they represent — they appoint road-masters, constables and other officers, and make provisions for the support of the poor in each parish, etc. In the same manner the pupils of graded school in our incorporated towns and cities should be taught that the city or town is divided up into wards; that from the city at large a presiding officer called the mayor is elected, and from each ward aldermen. They should know how often they meet, and some of their duties, such as making provision for taxation, providing means for extinguishing fires, and some of their powers with regard to appointing city officials.

It is a mistake to put off the teaching of the chapter, in Canadian history, upon the constitution of the Confederation till the completion of the book. This in my opinion should be taught as the pupil begins this study, along with the most recent events. I think that it is of Daniel Webster the story is told that he invested the first fifty cents he received as a boy in a handkerchief with the constitution of the United States printed upon it, and immediately committed it to memory. This may or may not have had something to do with the fact that he afterwards became the great defender and preserver of that same constitution. It would be well now-a-days, too, if more of our boys knew by heart the history of the constitution of our Confederation, and that it is the British constitution intact. Every teacher knows and appreciates how difficult it is to get children to express their ideas in proper language. It is in my opinion, the greatest difficulty that presents itself to teachers, and after the most painstaking efforts on their part, the success met with may be very small. Canadian history is one of the best subjects to improve pupils in this respect. It should be taught as much as possible orally, and each pupil should be provided with a note-book For, I am afraid, that if it were left to the text book to develop a love of country and kindle the sacred fires of patriotism within the youthful breast, they would smoulder long ere they burst into a glorious flame. I think we have something better to look forward to in this connection. It is to be hoped that, if only for this very purpose of promoting a love of country, and also a unanimity of spirit among the rising generation of this great land, there may be but one history used throughout the schools of Canada — one in which the history of each province shall not be written separately, but in which the contemporaneous events of each may be carried on together to the time of confederation, and from that date brought down to the present time in one general history. Until something like this is done, there still remains more to be desired before we may expect the greatest development of patriotism from the study of history in our common schools.

I have mentioned before, reading and composition as a means of introducing this sentiment to our pupils. It is a matter of regret that we have not yet reading books that have some reference to Canada. Our reading books are admirable in their way, but fail in this particular. Our country is young and we have still much to look forward to. The literature of a nation has always been a means of promoting love of country. I suppose if any one here present were asked to give a quotation from Scott, mostly all would commence, "Breathes there a man, with soul so dead, who never to himself hath said — this is my own, my native land." To illustrate the influence which this poem alone was judged to have upon the youthful mind, it is said Archbishop Whately when selecting a list of poems to be placed in the schools of Ireland, a number of years ago, struck this from the number, as he thought that in the unsettled condition of the country it might help to stir up rebellion. Our pupils should be given composition exercises upon portions of history of our country. Things learned by writing about them are not soon forgotten, and too much praise cannot be given a newspaper like the Montreal *Witness*, which has done much already to preserve local tradition, and to set the youthful mind thinking about the early history of the country and pioneer life, by giving prizes throughout the length and breadth of this Dominion to the pupils in the different counties. I believe firmly in the teaching of singing in our schools. Its influence is good, and the public themselves thoroughly enjoy it. For example, I have on one or two occasions been in schools where the teacher, when about to dismiss school, was interrupted by some little girl holding up her hand and saying, "Please, ma'am, can't we sing?" The teacher had evidently forgotten it; but the pupils were not to be cheated out of their song. The influence of singing in our schools good patriotic songs cannot be overestimated. In great crises in the affairs of nations, national enthusiasm and patriotic fervor have always broken out in songs. Take for example those that date their origin from the Southern rebellion in the States, the Jacobite songs in Scotland, and the Marseillaise in France. The power which this last song wielded over the soldiers of France during the latter part of the great Revolution is illustrated by a story told of a French general — Hocke I think it was — who, when hard pressed upon the frontier by German troops, sent to Paris for some regiments and a thousand copies of the Marseillaise. We in Canada have not yet a national song. That is one of the things we have to look forward to. But there are numbers of patriotic airs in our prescribed song books which should be taught our pupils.

(Concluded next month.)

Monument to Columbus.

The *Scientific American* of October 28th has an illustration and description of a design for a monument to Christopher Columbus, which may become one the features of interest at the world's fair at Chicago. The designer, M. de Palacio, a Spaniard, has conceived a most perfect form, the sphere, whose diameter is to be 1000 feet, and which is to be constructed of iron.

The following is a description of the magnificent design:

The colossal sphere is mounted on a base which is 262 feet high, and is crowned at its North Pole by the caravel which carried Columbus to the New World. The monument is brilliant with the colors of the continents, oceans and islands of the terrestrial sphere.

The sphere will be encircled at the equator by a platform 3,280 feet, or more than half a mile long. An exterior spiral running around the northern hemisphere will form a track nearly two miles long, leading from the equator to the North Pole. At night the sphere will be illuminated by the lines of light which will form the outlines of the continents and islands, thus casting over the city torrents of refulgent brilliancy. The great pyramids of Egypt, the Sphinx, and the Colossus could lie in the hollow interior like jewels in their case. So much for the exterior aspect.

An interior track runs around the southern hemisphere from the South Pole to the Equator, where it joins the exterior spiral. The total length of the spiral is nearly four miles, over which the sightseer can travel on a tramway.

In the base and under the majestic central rotunda will be placed a gigantic statue of the great discoverer surrounded by the navigators and missionaries who rendered his discovery fruitful. In the semicircle around this Olympus of heroes, inclosing the amphitheatre, will be allegorical statues representing all the Spanish nations.

In the remaining spaces of the compartments in the base a large Columbus library will be distributed; auditorium for the cultivation of the natural sciences, museums of Zoology, mineralogy, and botany of America, rooms for the Spanish Geographical Society, a great naval museum in the interior central compartment, a meteorological observatory in the hull of the caravel. All this is independent of the promenades, cafes, and restaurants for the public.

In the interior the celestial sphere can be exactly reproduced. It can also be used for magnificent panoramas, because the spherical form is the best for obtaining illusions of perspective. There will be a place for public entertainments.

Mr. Palacio secures the stability of this immense mass by means of a simple method similar to that used for equestrian statues, so that the sphere will be able to resist winds of greater force than a cyclone.

From a business point of view Mr Palacio makes the following calculation: One hundred thousand spectators paying an entrance fee of $1 will bring $100,000. This will replace the capital in 62 days, without counting the profits of the cafes, entertainments, etc. The estimated total cost is $6,000,000.

UNTIL quite recently grammar had always been regarded as a very important subject in the public school curriculum of Ontario, but for some time the opinion has been gaining ground that it has taken the place that practical language training should occupy. At the recent meeting of the Provincial Teachers' Association, Principal R. K. Row, of Kingston model school, crystalized this thought in a resolution, "that *technical grammar* should be removed from the public school programme except so far as it may be taught incidently in a thorough course of practical language training." He showed that the profitable study of grammar requires the best powers of trained minds, and therefore the part of the subject studied in public schools is very imperfectly understood. He also showed that those who never go farther than the public schools, comprise ninety per cent. of the whole school attendance, and that these do not make any use of the smattering of grammar acquired; and that owing to the time wasted on grammar, the training in the use of language has been all but generally neglected. A lively discussion followed the address, but the vote was nearly unanimous for the resolution. Mr. Row and Mr. Wm. Houston, M. A., of Toronto, were appointed to prepare a syllabus of language lessons for the public schools of the Province,

Glaciers.

In high valleys, among the mountains whose tops are covered with perpetual snow, are often found seas of ice, called "glaciers." They are formed thus: Snows that fall upon lofty mountains melts very little even in summer. So in valleys high up among the mountains it gathers to a great depth, and, from the weight of the snow lying above, the lower layers become icy, as a snowball does when squeezed. The upper crust melts a little during the heat of the day, and the water sinks down through the snow, and then freezes at night. From this melting and freezing the mass of snow is soon changed into a sea of ice.

Remember that when water freezes it expands. If we fill a bottle with water and let it freeze over night, in the morning we find that the bottle is cracked by the swelling of the ice. So it is with the water that form glaciers. When it freezes it stretches, and pushes its way down in whatever direction the valleys slope.

Glaciers of to-day are much smaller than the ice-seas of long ago, but still, in studying them, we learn to understand the old glaciers.

In traveling down valleys those ancient glaciers left traces of their journey. Over all the places where the ice-seas passed, the rocks are rounded and highly polished. A field of these rounded rocks, when seen from a distance, looks like a field filled with sheep crouching on the ground, and Swiss geologists have called them *roches moutonnées*—"sheep-like rocks." In a valley along the summit of the Rocky Mountains, near the "Mountain of the Holy Cross," there is a beautiful display of these polished, rounded rocks.

As the glaciers moved down the valleys, great rocks, frozen fast in the ice on the sides and at the bottom, stratched and marked other rocks as they passed by and over them. Sometimes these scorings are very broad and deep, for the immense rocks the glaciers carried were like strong, powerful tools in the grasp of a mighty engine; sometimes the lines are as fine as those of a fine engraving. They usually run all one way, and by looking at the direction in which the lines run, one can tell the direction in which the glacier moved. In the sandstone west of New Haven, Connecticut, the deep, broad scorings can be plainly seen, running toward the southeast. The height at which these scatches occur tells us something of the depth of the ice.

Markings in the White Mountains indicate that the ice was more than a mile deep over the region now known as northern New England.—*Teresa C. Crofton, in November St Nicholas.*

A Practical Geometry Lesson.

One chilly evening the sitting-room in which my pupils and I sat was warmed by a grate-fire. Shaking out some small live coals, I bade the boys observe which of them turned black soonest. They were quick to see that the smallest did, but they were unable to tell why. They were reminded of the rule they had committed to paper, but to no purpose, until I broke a large glowing coal into a score of fragments which became black almost at once. Then one of them cried, "Why, smashing that coal gave it more surface!" This young fellow was studying the elements of astronomy at school, so I had him give us some account of how the planets differ from one another in size, how the moon compares with the earth in mass, and how vastly larger than any of its worlds is the sun. Explaining to him the theory of the solar system's fiery origin, I shall not soon forget his keen delight—in which the others presently shared—when it burst upon him that because the moon is much smaller than the earth it must be much colder; that, indeed, it is like a small cinder compared with a large one. It was easy to advance from this to understanding why Jupiter, with eleven times the diameter of the earth, still glows faintly in the sky; and then to note that the sun pours out its wealth of heat and light because the immensity of its bulk has, comparatively speaking, so little surface to radiate from.—*From My Class in Geometry, by Geo. Iles, in The Popular Science Monthly for November.*

Tea and Coffee.

Who grows the tea?

China, 290 million lbs. per annum; India, 52 millions; Japan, 35 millions; Paraguay, 10 millions and Java 7 millions.

Who drinks the tea?

Great Britain, 167 million lbs. per annum; other countries, 114 millions; United States, 72 millions, Russia, 37 millions; Australia, 14 millions.

Who grows the coffee?

Brazil, 333,000 tons; Java, 70,000 tons; Ceylon, 29,000 tons; West Indies, 28,000 tons; Africa, 36,000 tons; Manilla, etc., 35,000.

Who drinks the coffee?

United States, 165,000 tons; Germany, 110,000, France, 55,000; Belgium and Holland, 50,000; Austria, 40; British Colonies, 38,000; Brazil, 23,000; Russia, 20,000; Norway and Sweden, 20,000; Great Britain, 15,000; Italy, 14,000.

School and College.

V. E. Coffin, B. A., (Dal.), has been appointed tutor in English in Cornell University.

A. S. MacKenzie, B. A., (Dal.), has won a fellowship in Johns Hopkins University.

Frederick MacLeod, B. A., (Dal.), has been awarded a $200 scholarship at Harvard.

New Glasgow High School opens the winter term with an attendance of 120 students; Pictou Academy, 194; Halifax Academy, 237.

No reports from other Academies at date.

Truro Academy boasts of adding the *Encyclopædia Britannica* to its library. Very good.

The Halifax Academy, during the last few years, has formed a library of over 500 volumes of the latest standard works in literature, English, French and German, and in popular science. The *Encyclopædia Britannica* and other cyclopedias are among them. This library is used to a very great extent by students, the duties of the librarian being quite onerous.

Pictou Academy is adding modern books to an interesting old library, which contains some specially curious and valuable works in its collection.

The English and classical authors for the preliminary law examination in Nova Scotia next February, are announced to be the same as in September, 1890.

County Academy Entrance Examinations, 1890.

Arithmetic and Algebra.

1. Add together, seventy-eight millions; eight thousand and ten; sixty-five thousand and forty; eight hundred thousand and fifty-five; four hundred thousand three hundred and one. State in words by how much the sum falls short of two hundred millions.

2. I have 10 bbls. of potatoes, each bbl. weighing 180 lbs.; there are three potatoes in each lb; how many square yards of land can I plant if I plant 20 potatoes in each sq. yd.?

3. Give the weight of a bushel of the following: Wheat, Oats, Potatoes, Barley, Beans, Corn, Buckwheat. How many steps does a man whose stride is 32 inches take, in walking 3 miles?

4. Define numerator, denominator, common fraction, decimal fraction, and simplify:

$$3\tfrac{1}{11} \div 1\tfrac{8}{9} \times 5\tfrac{1}{2} + \frac{3\frac{1}{2} - 1\frac{2}{5}}{3\frac{1}{2} + 1\frac{2}{5}}.$$

5. State the rule (1) for reducing a vulgar fraction to a decimal fraction; (2) a decimal to a vulgar fraction. Express in lbs. ·006 ton + 03 cwt. + ·09 of 3 qrs

6. The floor of a room measures 14 by $12\frac{1}{2}$ ft and is partly covered by carpet measuring $11\frac{1}{2}$ by $9\frac{3}{8}$ ft.; find the cost of covering the remainder with oil cloth at 90c. per sq. yd.

7. Find the simple interest on $750 from May 5th, 1887, to October 31st, 1890.

8. If a bankrupt's assets are worth $7,000, and his debts are $16,000, how much does he owe a creditor who receives $500?

9. Multiply the sum of $3x-4y$ and $3y-x$ by the sum of $2x-2y$ and $3y-3x$.

10. From a rod a inches long I cut off $b-c$ inches; how many inches are left?

11. The product of two algebraical expressions is $x^6+x^5y+x^4y^2-x^3y^3+y^6$ and one of them is x^2+xy+y^2; what is the other?

Grammar

1 Give the general rule for the formation of the plural of nouns.

Give the wanting singular or plural of the following; underline those which do not follow the general rule: Cat, Match, Wives, Children, Women, Roof, Taxes, Penny, Dies, Turcoman.

2. What is a pronoun? Give the declension of the Personal Pronouns.

3. Define Voice, Mood, Tense, and write out a scheme of the tenses of the Indicative Mood, Active Voice, using the verb *take*.

4. Distinguish between the *weak* and the *strong* conjugation, and give the principal parts of the following verbs, classifying them as weak or strong: *Think, strive, pay, cut, eat, shoot, know, teach, feel.*

5. What may the "Extension of the Predicate" consist of?

6. Correct, where necessary, the following sentences: I knew it to be he. The boiler bursted yesterday. Three months' salary were paid Henry and not you is to blame. Who do you think me to be? Nothing but picture books please him.

7. Parse and analyze the following:

> Underneath day's azure eyes
> Ocean's nursling Venice lies.

QUESTION DEPARTMENT.

A. P. M.—My school comprises grades 5, 6, 7 and 8. Besides these there is always a class who have completed the above work, and take selected studies in high school course. I wish to make the examination of pupils passing into the latter class correspond as nearly as is possible to the County Academy entrance examination, having the papers carefully preserved, subject to re-examination by the trustees; and to award to successful candidates certificates signed by trustees and teacher. Do you not think it will serve as a stimulus to greater effort on the part of pupils? Besides, I know of no examination being given before, and now the pupils seem to think they earn promotion by "being in the eighth grade" for a few terms. Will you kindly give your opinion of my plan?

We think the idea a capital one. The County Academy examination papers, besides being drawn out with great care and good judgment by the education department on the proper work of the common school course of study, is also the official test of ability for high school work. In schools where candidates are not likely to have access to these papers before their examinations, no papers could be better adapted to the purpose. We shall henceforward endeavor to publish these in our November and May issues, so that all teachers may have access to the papers as soon as possible.

BOOK REVIEWS.

How to Preserve Health, by Louis Barkan, M. D. Publishers, American News Co., New York. Price, in cloth, $1.00; contains a great number of valuable suggestions on preserving health; useful in the school-room and household.

Language Work Below the High School, by Dr. Charles DeGarmo. Public School Publishing Company, Bloomington, Ill. Dr. Charles DeGarmo, professor of English and modern languages in the Normal University of Illinois, has edited an admirable series of language books for second, third and fourth year grades. They are adapted from the German, and are the result of a hundred years of experience in the schools of that country. The aim in these little books is, (1) To carry on together composition and sentence study; (2) To make the sentence study a gradual and easy approach to the study of grammar; (3) To cultivate an interest in permanent literature: (4) To relieve the children and teachers of much of the blackboard work in language teaching now required ; (5) To assign each lesson definitely so as to insure brief and definite written exercises, easily examined by the teacher. The exercises are adapted to the ability of the pupil, and are intensely interesting to them. There are three numbers, each containing a year's work, strongly bound in flexible cloth covers, and the retail price is only 12 cents each.

Elementary Classics: *Xenophon's Anabasis* (Exercises); *Xenophon's Anabasis*, bk. IV.; *Vigil's Æneid*, bk X. and bk. VIII Publishers, MacMillan & Co., London and New York. These four little volumes in the Elementary Classic series are edited, with notes and vocabularies, by eminent scholars. They are cheap, neatly printed, and with excellent notes.

Heath's Modern Language Series.—Molière's *Le Bourgeois Gentilhomme*, *Le Médecin Malgré Lui*, and *Le Tartuffe*. Edited with notes by F. E. A Gasc, and published by D. C. Heath & Co , Boston The student of French literature will find in convenient form three of the finest plays of Molière, with explanations sufficient, with some previous knowledge of French, to enable him to read with ease and profit.

The Morning Hour; a daily song service Price, $1.00. Publishers, Ginn & Co , Boston. This excellent song service is the joint work of three teachers and is designed to furnish a series of opening exercises for advanced and high schools. The arrangement and variety are admirable.

Hand-book of Historic Schools of Painting.—Price, $1 00. Publishers, Ginn & Co., Boston. The aim of the author — Deristhe L. Hoyt, instructor in Massachusetts Normal Art School — is to give in a more simple and condensed form than has hitherto been attempted some general knowledge of the principal schools of painting, their characteristics, chief artists, and some of the most noted paintings executed by each.

Second Annual Report of the Statistics of Railways of the United States to the Interstate Commerce Commission, for the year ending June 30th, 1889, pp 566, 9 × 6 in. Washington, Government Printing Office, 1890. A valuable contribution of facts to the science of political economy, specially valuable to those who are concerned in the development of railway operations in America, and in directing these tremendous interests for the general good of the whole social organism.

The Veto Power, its origin, development and function in the government of the United States (1789–1889), by Edward Campbell Mason, A. B., Instructor in political economy, edited by Albert Bushnell Hart, Ph. D , Assistant Professor of History, pp. 232, 6 × 9 in. (Boston, U. S. A., Ginn & Co , 1890). This is No 1 of the "Harvard Historical Monographs"—the first of a series thus promised us by the Harvard University. The work, proper, is confined to the first 140 pages, and is presented in a well classified and most lucid manner generally. The appendix contains a list of all the vetoes with condensed outlines of the cases. The work indicates extensive reading, close and thorough research, which it puts in the possession of the reader without effort and with much pleasure.

Our Government, How it Grew, What it Does, and How it Does it, by Jesse Macy, A. M , Professor of constitutional history and political economy in Iowa College. Revised edition. pp. XII. + 296, 5 × 7½ in. Price $0.85. (Boston, U. S. A., published by Ginn & Company, 1890). A very fine text-book for United States high schools, a capital book for any one to get a good view of the government of the United States in a small compass, a similar book on our Canadian government, would be a splendid incentive to the introduction of civics into our high school work in connection with history.

A Brief History of the Empire State, for school and families, by Welland Hendrick, A. M pp. 203, 5½ × 7 in. $0.75. (Syracuse, N. Y. C. W. Bardeen, 1890). A well written, well arranged, and well printed history.

Ancient History for colleges and high schools, by P. V. N. Myers, acting professor of history and political economy in the university of Cincinnati; author of "Mediæval and Modern History" and a General History." Part II., a History of Rome. pp. 122, 5 × 7½ in. $1 10. (Boston, U.S.A., Ginn & Co., 1890). Such books are now innumerable. This one will compare favorably with any of its size.

A Chart of English Literature, with references, edited by George Edwin Maclean, Ph D., professor of English language and literature in the university of Minnesota. pp. VII + 13, printed on one side, 8 × 12½ in. (Boston, U.S.A., Ginn & Co., 1890). This is a good conspectus of the history of English literature, giving in one view columns for minor periods, eras, ages. Authors in poetry, with dates and leading works; authors in prose, with dates and leading works. Period and sovereign. Nothing better to give a complete general view in chronological order, to the student who has a considerable acquaintance with English literature.

BOOKS RECEIVED.

GERMAN COMPOSITION, by Prof. Chas Harris. D. C. Heath & Co. publishers.

TWO LATIN PLAYS, by Frank W. Nicolson, A.M., Harvard, and by John C. Rolf, Ph. D., Harvard. Ginn & Co., publishers.

The Annual Convention of the Nova Scotia Provincial Educational Association

Will open in the Halifax Academy on Monday, December 29th, at 8 p. m., and close on the 31st.

The programme will include:

1. A glance at the Schools of Great Britain by Dr. Allison, Superintendent of Education.

2. The German School System, by Dr. Hall, of the Normal School.

> NOTE.—Dr. Allison has lately returned from a tour of inspection of English and Scottish Schools Dr. Hall has spent the last year in Germany. He will demonstrate the superiority of their schools and pedagogical training.

3. Prof. Seth, of Dalhousie College, on Psychology and Education.

4. Prof. Andrews, of Mount Allison College, on Some Phases of Science in Relation to the Schools.

5. An educational mass meeting in the Academy of Music on Tuesday evening. His Grace Archbishop O'Brien, Lord Bishop Courtney, Hon. Provincial Secretary Fielding, Hon Attorney General Longley have agreed to speak on this occasion. Addresses may also be expected from the Rev. Dyson Hague, of St. Paul's church, Rev. D. M. Gordon, of St. Andrews, Rev. Mr. Moore, of Grafton street church, Alderman Lyons, of the Halifax School Board, R. C. Weldon, D. C. L., M. P., Dean of the Law Faculty Dalhousie College, and the Rev. Dr. Sawyer, of Acadia College.

6. A full discussion of the report of a special committee appointed by the Superintendent of Education to draw up an improved course of study for the public schools and academies of Nova Scotia.

> NOTE.—Teachers are requested to assist by suggestions or otherwise.

The excellence of the programme, and the attractions of the capital at the holiday season, should ensure a large attendance of educationists and others.

ALEX. MCKAY,
Secretary.

$5,000 Prize Competition.

The third great Word Competition for the "Canadian Agriculturist and Home Magazine." Canada's great and popular Home and Farm Journal, is now open. The following magnificent prizes will be given free to persons sending in the greatest number of words made up out of the letters contained in the two words, "The Agriculturist": 1st prize, $1,000 in Gold; 2nd prize, $500 in Gold; 3rd prize, $1,000 Grand Piano; 4th prize, $500 Grand Piano; 5th prize, $300 Organ; 6th prize, Ticket to England and return; 7th prize, Lady's Gold Watch; 8th prize, Gents' Gold Watch; 9th prize, China Tea Set; 10th prize, Hunting Case Silver Watch; 11th prize, Boy's Silver Watch. 25 prizes of $10 each. 50 prizes of $5 each. 100 prizes of $2 each. 200 prizes of $1 each. Making a total of 386 prizes, the value of which will aggregate $5,000. This Grand Word-Making Competition is open to everybody, everywhere, subject to the following conditions: The words must be constructed from the two words, "The Agriculturist," and must be only such as may be found in Webster's Unabridged Dictionary, and in the body of the book, none of the supplement to be used. The words must be written in ink on one side of the paper only, and numbered in rotation, 1, 2, 3, and so on to the end of the list, for falicitating in deciding the winners. The list containing the largest number of words will be awarded first prize, and so on in the order of merit. Each list as it is received at the office of the "Canadian Agriculturist" will be numbered, and if two or more tie on the largest list, the first received will be awarded the first prize, the next second and so on. Therefore, the benefit of sending in early will readily be seen. Each list must be accompanied by $1 for six months' subscription to the "Canadian Agriculturist." One person can send in one or more lists, accompanying each list with $1, for which the paper will be sent to any address for six months. The best family paper in Canada. It is by no means a new paper, but has been established upwards of seven years, and each year grows in the estimation of the subscriber. It contains no trashy, highly colored fiction, but has interesting stories of a higher class by the most popular authors of the day. It is eminently THE paper for the home circle, and at $2 a year is the cheapest and best paper in the market The competition will commence now and remain open for three months Remember, you are paying $1 for six months' subscription to one of the best home papers in Canada, and at a same time run a good chance of winning a valuable prize.

☞ Everyone sending a list of not less than twenty words will receive a present.

Wide Awake for 1891.

(100 pages).

WIDE AWAKE, beginning with the holiday number, is permanently enlarged to one hundred pages, radiant with new and large type, a new style of page, and fresh, strong literary and pictorial attractions.

Mrs. Burton Harrison, whose story of "The Anglomaniacs" has been the sensation of the season in *The Century*, has written for WIDE AWAKE a story called "Diamonds and Toads."

Hon. John D. Long, (ex-Governor of Massachusetts), furnishes six articles, under the general title of Our Government, for the enlightenment of coming citizens, the boys and girls of to-day.

Kirk Munroe, who lately lived for a time the life of a railroad man, in all phases from parlor car to cattle cage, has put his experience into a thrilling serial for boys called Cab and Caboose. Striking pictures by Edmund H. Garnett.

Margaret Sidney's new serial, Five Little Peppers Grown Up, will tell more about Polly and Jasper and David and Joel and Phronsie, and others, as it runs through the year. Fifty charming illustrations by Charles Mente.

Marietta's Good Times will chronicle in her own words, from her own manuscript, the childhood adventures of Marietta Ambrosi.

Miss Matilda Archambeau, Van Dorn the little girl who had a great many ancestors, is an irresistible little folks' serial, by Elizabeth Cumings.

Unusually interesting articles, some elaborately pictorial.

Some Problems in Horology, by E. H. Hawley of the Smithsonian Institution Washington, will interest High School students—three sets of Cash Prizes.

The best of Short Stories from thousands offered and solicited the past year.

The Landing of the Pilgrims, a fac-simile reproduction of Felicia Heman's famous poem, from the original *MS.*, now in Pilgrim Hall, Plymouth

Figure Drawing for Children, in twelve illustrated lessons, by Caroline H. Rimmer, with four prize offers each month.

Fine ballads by Graham R. Thompson Harriet Prescott Spofford, Mary E. Bradley and Laura E. Richards, beautifully illustrated by Garnett, Sandham and Taylor.

The ever popular Ways to do Things, the School and Playground Stories, Tangles, Post-Office and Men and Things.

Wide Awake is only $2.40 a year.

D. LOTHROP COMPANY, Boston.

Children's Literature.

WHAT "ST. NICHOLAS" HAS DONE FOR BOYS AND GIRLS.

Victor Hugo calls this "the women's century," and he might have added that it is the children's century as well, for never before in the world's history has so much thought been paid to children—their schools, their books, their pictures, and their toys. Childhood, as we understand it, is a recent discovery.

Up to the time of the issue of the *St. Nicholas Magazine* seventeen years ago literature and children's magazines were almost contradictory terms, but the new periodical started out with the idea that nothing was too good for children; the result has been a juvenile magazine genuine with conscientious purpose,—the greatest writers contributing to it, with the best artists and engravers helping to beautify it, —and everything tuned to the key-note of youth.

It has been the special aim of *St. Nicholas* to supplant unhealthy literature with stories of a living and healthful interest. It will not do to take fascinating bad literature out of boys' hands, and give them in its place Mrs. Barbauld and Peter Parley, or the work of writers who think that any "good-y" talk will do for children, but they must have strong, interesting reading, with the blood and sinew of real life in it,—reading that will waken them to a closer observation of the best things about them.

In the seventeen years of its life *St. Nicholas* has not only elevated the children, but it has also elevated the tone of contemporary children's literature as well. Many of its stories, like Mrs. Burnett's "Little Lord Fauntleroy" have become classic. It is not too much to say that almost every notable young people's story now produced in America first seeks the light in the pages of that magazine.

The year 1891 will prove once more that "no household where there are children is complete without *St. Nicholas*." J. T. Trowbridge, Noah Brooks, Charles Dudley Warner, and many well known writers are to contribute during this coming year. One cannot put the spirit of *St. Nicholas* into a prospectus, but the publishers are glad to send a full announcement of the features for 1891 and a single sample copy to the address of any person mentioning this notice. The magazine costs $3.00 a year. Address The Century Co., 33 East 17th street, New York, *Please mention* THE EDUCATIONAL REVIEW.

A Great American Magazine.

THE SUCCESS OF "THE CENTURY" AND ITS PLANS FOR 1891.

The Century Magazine is now so well known that to tell of its past success seems almost an old story. The N. Y. *Tribune* has said that it and its companion, *St. Nicholas for Young Folks*, issued by the same house, "are read by every one person in thirty of the country's population,"—and large editions of both are sent beyond the seas. It is an interesting fact that a few years ago it was found that seven thousand copies of *The Century* went to Scotland,—quite a respectable edition in itself. The question in England is no longer "Who wants an American book?" but "Who does not see the American magazines?"

A few years ago *The Century* about doubled its circulation with the famous War Papers, by General Grant and others, adding many more readers lately with the Lincoln History and Kennan's thrilling articles on the Siberian Exile System. One great feature of 1891 is to be "The Gold Hunters of California," describing that remarkable movement to the gold fields in '49, in a series of richly illustrated articles *written by the survivors*, including the narratives of men who went to California by the different routes, accounts of the gold discoveries, life in the mines, the work of the vigilance committee, etc., etc. In November appears the opening article, "The First Emigrant Train to California,"—crossing the Rockies in 1841,—by General Bidwell, a pioneer of pioneers.

Many other good things are coming,—the narrative of an American's travels through that unknown land Tibet (for 700 miles over ground never before trod by a white man); the experiences of War Prisoners; American newspapers described by well-known journalists; accounts of the great Indian Fighters, Custer and others; personal annecdotes of Lincoln, by his private secretaries; "The Faith Doctor," a novel by Edward Eggleston, with a wonderfully rich programme of novelettes and stories by most of the leading writers, etc., etc.

It is also announced that *The Century* has purchased the right to print, before its appearance in France or any other country, extracts from advanced sheets of the famous Talleyrand Memoirs, which have been secretly preserved for half a century. All Europe is eagerly awaiting the publication of this personal history of Talleyrand—greatest of intriguers and diplomats.

The November *Century* begins the volume, and new subscribers should commence with that issue. The subscription price ($4.00) may be remitted directly to the publishers, The Century Co., 33 East 17th street, New York, or single copies may be purchased of any newsdealer. The publishers offer to send a free sample copy—a recent back number—to any one desiring it

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McGILL UNIVERSITY,
MONTREAL.

The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 15th. 1890).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.) J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., JANUARY, 1891. $1.00 PER YEAR

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Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John. N. B.

EDITORIAL NOTES.

No subscriber, we are sure, would knowingly do us an injustice, yet many change their address without giving us due notice, and the paper is continued to the old address, causing loss and placing us at a disadvantage. It is the duty of honest and careful postmasters either to forward the paper to the new address or return it to the office of publication. As the paper sometimes fails to find subscribers in their new homes, or to find its way back to the office, we would thank our subscribers to attend to this matter themselves — promptly notify us on a postal card of a change of address.

WE give elsewhere a very meagre sketch of the proceedings of the educational convention at Halifax, but enough to indicate its character. In the first place it holds out Nova Scotia as an example which may well be striven after in many a proud section of the globe; for, on the same platform representatives of all religious denominations and schools of thought of any importance worked together side by side, advancing the general good of the country by counsel or friendly criticism in educational matters. Not a word was expressed in all the discussions calculated to irritate any individual or class to the slightest extent. The general drift of the papers read was psychological. But most important of all, although there was not one-tenth a sufficiency of time for the full general discussion of it, was the proposed modified courses of study. The course for the common schools was printed; but it is too voluminous for reproduction in this issue. The report of the committee on the high school course will soon be printed, and will probably come into force before the modification of the common school course. It is in line with the resolutions passed. The committees have altogether spent a full week in hard, continuous work and discussion over these; and yet we fancy some of our readers will make "short work" of the whole on their very first reading of it.

WE cannot believe that the government of New Brunswick seriously contemplates the removal of the present Chief Superintendent of Education. While such a report has been current for some time past, there have been no reasons advanced for the change, except those of a purely political character; and these should be of little weight when it is borne in mind that the present incumbent has always had at heart the best interests of education in this Province; that his administration has been, in general, satisfactory, and that the great majority of teachers would look with disfavor on his removal.

As no meeting of either the New Brunswick or Nova Scotia Educational Association will be held this year, would it not be a good plan to hold a convention of high school teachers of the Atlantic Provinces during the next Christmas vacation? The teachers of each Province might meet separately the first day, organize, and discuss matters peculiar to advanced education in each Province; and on the second day meet on a common platform. There are many reasons why such a meeting should be held. Now, who will set the ball rolling, and rolling to such a purpose that before it ceases, the meeting will be an accomplished fact.

Mt. Allison, Dalhousie, and St. Francis Xavier Colleges were the only ones represented at the Provincial Educational Association. Professor Andrews, Professors Seth and MacMechan from Dalhousie, and President McNeil from St. Francis Xavier. The Horton Academy at Wolfville was represented by Principal Oakes.

Bishop Cameron, of Antigonish, is winning unstinted praise from reformers in all religious denominations for his powerful pastoral on the temperance problem.

The executive committee of the New Brunswick Provincial Educational Institute decided at its recent session in Fredericton to hold no meeting this year, in order to give its members the opportunity to attend the United States National and Ontario Teachers' Associations at Toronto July 13–17; or the meeting of the American Institute of Instruction at Bethlehem, N. H., one week earlier; or the Summer School of Science at Antigonish, N. S., beginning about July 20th.

We welcome the appearance of two new periodicals since our last issue: *Canada*, edited by Rev. M. R. Knight, Benton, Carleton Co., N. B., well known for his scholarly tastes and graceful verses, and published by the N. S. Printing Co., Halifax. It is neatly printed, on good paper, and has contributions from well known literary people. In his salutatory the object is stated, "to create, where it is uncreated, and to foster and develop where it exists, a spirit of Christian patriotism in Canada." The *Methodist*, a religious weekly newspaper, edited by Rev. Dr. Wilson, and published by E. A. Powers, St. John. In its opening editorial it states its purpose, "to furnish weekly a pure, healthy paper, distinctively Methodistic, but broadly Christian," * * * "not a rival to the *Wesleyan*, but a fellow worker." It has made a good start and gives promise of being an excellent family newspaper. The scholarly contributions by Mr. S. D. Scott, of the *Sun*, on "The Great Hymns of the Church," is one which no student of church history should fail to read.

The establishing of a chair of philosophy at the University of New Brunswick has been definitely arranged, and Mr. Walter C. Murray, who has been appointed to it, will enter upon his duties in October next, on the opening of the collegiate year. Mr. Murray is a native of Kings Co., N. B., and was graduated from the University at the head of his class in 1886. In 1887 he won the Gilchrist scholarship and went at once to Edinburgh. His course, since he first entered the university, has been one of marked success.

Such progress—the establishment of three new chairs in less than as many years—cannot fail to give an increased efficiency and a wider influence to the higher education in New Brunswick, the more especially as the establishing of these three chairs—in engineering, physics and philosophy — meets the popular demand of a broader scholarship and training of a technical character.

We are pleased to notice the publication by A. F. Church of a new map of Nova Scotia. It is, we think, the most accurate yet, and makes a specialty of indicating where valuable minerals are located by about twenty different conspicuously colored or shaded marks. It is, therefore, well named "Church's Mineral Map of Nova Scotia.' It is especially interesting in the school room.

NEWFOUNDLAND.

We observe that the subject of public education is at present exciting more than usual attention in this island. The education committee of the House of Assembly have been offering a widely advertised prize for the best essay dealing with the problem of a better public system, the various points of which are specified in systematic detail.

In the *Telegram* of the 19th of November last, we think, there was an editorial countenancing a national system instead of a denominational one. Among all denominations there are prominent men in favor of some such solution of the problem. Whether the country is ready for such a move is, to outsiders at least, rather doubtful.

The Twillinggate *Sun*, we notice, has often had articles or communications stimulating educational reform or activity. For the benefit of our Newfoundland readers, who may not otherwise see it, we quote a portion of the article. The *Sun* is certainly right in the stand which it has been taking: and in no way can a newspaper better benefit the island than by advancing and pushing a sound and active educational policy:

> A Teachers' Convention.
>
> It may be remembered by many of our readers that some months ago reference was made in our columns to the above

subject, and the practicability of instituting a teacher's convention was then expressed and recommended. We are pleased to observe from last month's Educational Review, a valuable monthly periodical for teachers, published in St. John, N. B., that the wisdom of such a convention is also mooted, and it would undoubtedly prove a stimulus to our educational institutions if such suggestions were acted upon by the teachers of all the day schools throughout the colony, and we see no reason whatever why it should not be so. Our school teachers as a rule are poorly paid, and this fact is noted by our contemporary already mentioned. In giving statistics of our schools, gleaned from the last annual reports of the respective superintendents, it says: "It can be readily seen that, so far as salary is concerned, our fellow workers in the ancient colony are not so well off as ourselves;" which point, as the writer says, is forcibly pointed out in the last reports of the superintendents. By the teachers of all persuasions meeting together once a year, at least, it would not only have the effect of creating bonds of sympathy for each other, and in each other's work, but their united action might tend to secure for them eventually a better financial standing than they at present occupy. Unless the salaries are something after the rate, it cannot be expected that a superior class of teachers will be retained in our various educational institutions; for a man who holds a first grade certificate is capable of earning a much larger salary per annum than the great majority of our teachers receive; and, therefore, it cannot be expected that our school system in the outports will ever become what it ought to while the inducements held out for first-class teachers are so discouraging.

TONIC SOL-FA IN NOVA SCOTIA.

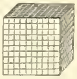
Rev. James Anderson, M. A., the contributor of our series on the "Tonic Sol-fa" system of musical instruction, has been appointed by the government of Nova Scotia to visit the schools of the leading sections in the Province to aid the teachers in the introduction of the system. No expenditure on our educational system will return a larger percentage of benefit than the item for this purpose. Mr. Anderson has already visited the schools of Truro, Amherst, Springhill and Pictou; and has found the teachers making very creditable showings. During January and February the schools of Lunenburg, Bridgewater, Shelburne and Liverpool will probably be visited. After a few weeks of practical instruction from Mr. Anderson, nearly all teachers will be qualified to give practical instruction in their schools. Its simplicity and naturalness are the qualities which made the system so successful in Great Britain, United States and Ontario. A great many of the teachers have taken "junior" certificates from the tonic sol-fa college, of which Mr. Anderson is a duly accredited examiner. A few have taken "elementary" or second degree certificates. We shall endeavor to publish a complete list of all these, as they are reported.

FERNDALE SCHOOL.

World Weights and Measures.

> Not chaos-like together crushed and bruised,
> But, as the world, harmoniously confused;
> Where order in variety we see,
> And where, though all things differ, we agree.
>
> Pope.—*Windsor Forest.*

III.



Cubic centimeter with face divided into square millimeters.

T. To-day we shall have a lesson on weight. Here we have a cube centimeter, which is a very convenient part of our world measure to take for a unit of weight. A cube, you know, is the same in its three dimensions of length, breadth and thickness. Shall we take a piece of gold, or lead, or iron, or stone a centimeter in length, breadth and thickness—just about the size of the top of the little finger. Well, which is the most common substance to be found in every part of the world and can always be had pure when required?

S. Water.

T. Correct. Water can be had pure by distillation; and it is heaviest when a little above the freezing point. So, a cubic centimeter of pure cold water is taken as the unit of weight, and it is called a gram. What would the tenth of a gram be called then?

S. A decigram.

T. Correct. And the hundredth of a gram?

S. A centigram.

T. Very good. And the thousandth of a gram?

S. A milligram.

T. Suppose we cut a cubic centimeter out of a potato. Will it weigh more or less than a gram?

S. More; because the potato, is a little heavier than water.

T. Very good. Let us cut our potato centimeter into ten equal slices. How thick will each be?

S. A millimeter.

T. True. Take one of these slices and cut it into cubic millimeters. How many will there be?

S. One hundred in one slice. You can see the one hundred little squares drawn on the front big square of the cubic centimeter on the black board.

T. How many cubic millimeters in a cubic centimeter then?

S. One hundred in each slice—one thousand.

T. Right. How many cubic centimeters would there be in a cubic decimeter then?

S. Just the same—one thousand.

T. Very good. A vessel a decimeter in length, breadth, and depth would then contain how many grams of water?

S. One thousand grams of water.

T. Now, a cubic decimeter would be a convenient measure for things now measured by the pint or quart. What convenient, natural measure approximates it?

S. A decimeter is about a hand-breadth — a hand-breadth every way — why, a cubic decimeter would be a measure large enough to admit a fist which is not too big.

T. Yes; the measure is nearly equal to a quart — about 1¾ pints, and it is called a liter. How many grams of water would a liter hold?

S. 1000.

T. How many liters of water in a cubic meter of water?

S. A cubic meter is ten times longer, ten times broader and ten times deeper than a cubic decimeter — one thousand.

T. Correct. A tank is 3 meters long, 2 meters broad and 1·5 meters deep; how many cubic meters of water will it hold?

S. Nine cubic meters.

T. How many liters of water, therefore?

S. 9,000 liters.

T. What is the weight of the water in the tank?

S. A liter of water weighs 1000 grams, 9000 liters weigh 9,000,000 grams,

T. If the tank is to be filled with sand, which is twice as heavy as water; what weight of sand must be carted to the tank to fill it?

S. 18 million grams.

T. If the tank is to be filled with mortar 2·5 times heavier than water; what weight will be required?

S. 2·5 × 9,000,000 = 22,500,000 grams.

T. Very good. Could we find the weight of material from its dimensions so easily if we used feet and inches, and pounds? I hardly think it.

In our next lesson we shall try to make easy the remembering of how to reduce English weights and measures to their corresponding "world" or "metric" system, as it is called, and *vice versa.*

IV.—Reduction.

T. Now, so long as any other system of weights and measures is used we must very often have to express one in terms of the other. What do you call that?

S. Reduction, I suppose. Reducing a number from one system to the same thing in the other.

T. Correct. This laborious work must continue until the one system is universally adopted.

S. Yes, there are long lines of decimals showing how many inches in a meter, decimeter, centimeter, millimeter, and so forth—and the same for any other measure or weight.

Another S. And meters, grams, etc. are given in decimals—long decimals of inches and pounds, etc. I think it would be impossible to commit them all to memory like the other reduction tables.

T. We shall see. You will only have to *remember two* long decimal fractions; and I think we can make them pretty easy to remember. One for weights and one for measures.

S. That would be very nice if it could be done.

T. Well, I think we can—so well, too, that no one can forget it if he tries. You all know the smallest weight in our old kind of weights.

S. Yes. The grain, pretty nearly the weight of a grain of wheat.

T. Can you find how many grains in any of our old weights?

S. Yes; for every pound avoirdupois is 7,000 grains.

Another S. And every pound apothecary is 5,760 grains.

Another S. And every pound Troy is 5,760 grains.

T. Very good. If I can show you how to change grains into grams, you can therefore change all the old weights into the new metrical weights, or a metrical weight into the old-fashioned ones. Now I have to ask you a strange question. Is a man's body heavier or lighter than water?

S. Heavier, because he will sink.

Anther S. Lighter, because he can float.

T. Well, let us compromise them. You will all agree that whether it is lighter or heavier than water, it is pretty nearly as heavy as if it were made of water. Now, what part of a man's body is about a cubic centimeter in length, breadth and thickness?

S. The top of his little finger, of course.

T. If one of the big boys, by a sad accident, had the top of his little finger cut off right at the base of the nail, what would the bulk of it be very nearly?

S. About a cubic centimeter.

T. Let me see, how many of your little fingers would come near that size. Put your little finger on our drawing of a square centimeter. The smaller boys and girls can try their biggest finger, and it will be pretty nearly a cubic centimeter. But who can tell me how much the top of that finger should weigh?

Jack. Why, a gram. Because a cubic centimeter of pure cold water weighs exactly one gram, and the human body is about the same weight as water.

T. Very good, Jack. You have caught the idea. The top of your finger is not far from the weight of a gram. How many now have the weight of the gram at the tips of their fingers?

(All hands up with more ruffling than usual).

T. If you have the gram at the tips of your fingers, you have not yet got the grains, at the same place.

JACK. No, but we are feeling for them.

T. Very good. How many large wheat, barley, or rice grains would make a bulk as big as the "gram top" of your finger, would you guess?

S. Ten, fifteen, twenty!

T. Not so bad. Your average guesses are pretty nearly correct. Now if you imagine the gram top of your finger to be broken into grains, there would be about fifteen grain fragments. I am now going to give you an imaginary ring to bind all these fragments into an exact gram weight. This imaginary ring is a magic ring, for it will bring to your mind the long decimal number exactly. How many are ready to put this ring on their fingers?

(All hands up).

T. Well, the ring is made up of numbers, a set of five numbers, all in order—just as many as the hand has fingers. Who can guess what the figures may be?

S. I suppose, 1, 2, 3, 4, 5,—that is the simplest set of five figures one can think of.

T. Very good. Imagine that row of figures to be made into a ring about your finger. Which figures would we have to solder together?

S. The 1 and the 5, thus: $\begin{array}{ccc} & 3 & \\ 2 & & 4 \\ & 1\;5 & \end{array}$

T. Very well. The 1 and 5 soldered together will make a 15, the others may be straightened out as the decimal fraction. How many grains in one gram now?

S. 15·432.

T. Correct to three decimal places. You can easily remember it, because the numbers are 5 4 3 2 1, with the last figure brought around to touch the first, and the two touching figures make the whole number. How can you find the number of grams in our ordinary pound?

S. 1 lb. = 7,000 grains. But every 15·432 grains = 1 gram. ∴ 7,000 ÷ 15·432 = number of grams in 1 lb. = 453·6029 grains.

T. Correct. I will lastly give you the second and last number to commit to memory—and that is all the memory work necessary. One meter is equal to 39·37 inches. For rough estimates we may count the meter as nearly equal to 40 inches; but exactly it is—

S. 39·37 inches.

T. The 39 is so nearly like the 37 that I hardly think any one can forget it. Try if you can. But you cannot. Find how many meters in a mile.

S. A mile equal to 1,760 yards, multiplied by 3, = 5,280 feet. Multiplied by 12, = 63,360 inches. But every 39·37 inches is one meter. Therefore 63,360 ÷ 39·37 = number of meters in a mile, = 1609·34 metres.

T. Correct. These two facts, then, we must always remember, if we are to be independent of tables; 15·432 grains = 1 gram, and 39·37 inches = 1 meter. We shall have some exercises in a future lesson.

Astronomical Notes.

THE MOON AND THE WEATHER.

"If Christmas comes during a waxing moon we shall have a very good year, and the nearer to the new moon the better; but if during the waning moon a hard year, and the nearer the end of the moon so much the worse."

That's one of the good old-fashioned bits of moon-weather wisdom. If it is true, this year will be a "very good" year, but yet not one of the very best; for, although Christmas came during a waxing moon the waxing was nearly all done—full moon occurring just two hours (60° time) after midnight on Christmas last.

What basis of fact this weather saw may have to rest on I don't know. If it is like a good many others of its kind, it probably owes its existence to what somebody said were the results of what somebody else thought were the observations which some other body was supposed to have made at some time or other.

Here is another, which seems to be propped by some facts. I take it, as I did the first, from a three-year old article in Longman's magazine:

"One of the most curious, and certainly one of the most widespread, of all weather beliefs is that of the Saturday moon. The notion is that when the new moon falls on a Saturday it is invariably followed by a period of wet and unsettled weather. The currency of this belief is remarkably wide. Not only is it found (more or less modified) in the folk lore of England, Scotland, and Ireland, but it is held also by seamen of all nationalities. A traveller relates that he once heard it referred to by a Chinese pilot. And more than this, in 1848, a Dr. Forster announced to the Royal Astronomical Society, as the result of an examination of weather registers kept by his grandfather, his father, and himself, extending over nearly eighty years, that nineteen times out of twenty a new moon on Saturday was followed by twenty days of rain and wind. It is not many weather sayings that enjoy the supporting testimony of a solar scientific investigation, and that circumstance, together with the general acceptance in which the saying is held, entitles it to 'special consideration." The writer proceeds to give it 'special consideration,' and then winds up with, 'We are obliged to include this much-respected saying in the category of idle superstitions.'"

It happens that the moon of this present month of January, 1891, is a "Saturday moon." It will be a "Saturday moon" all over the earth, except just for the strip lying between 130° and 180° east longitude —there it will be a "Sunday moon." The astronomical date of the new moon is Saturday, January 10th, 3 hours 24.5 minutes. If the "Saturday moon" notion is correct we ought to have a lot of wind and rain from January 10th to the end of the month, and this weather ought to prevail all over the surface of the earth, except in Japan, Papua, the eastern part of Australia, and a strip of the Pacific ocean. Let those interested in what infidels call "idle superstition" keep an eye on (and a record of) the weather from now to the end of the month. In the course of the next four years there will be nine more "Saturday moons," the dates of which are:

1891. June 6, October 17.
1892. February 27, July 23, November 19.
1893. March 18.
1894. January 6, May 5, September 29.

Sometimes a whole year passes without a "Saturday moon"; 1881 was such a year. Sometimes there is only one in a year, *e.g.*, 1893; sometimes two, *e. g*, 1887; sometimes three, *e. g.*, 1891, 1892, 1894.

The "Saturday moon" is a one-sided sort of affair. It associates itself only with foul weather. The "attitude" of the moon (especially the new moon) as seen in the sky — whether standing on end or lying on her back — is a more impartial meteorological arbiter, sending fair weather or foul, according to the form of the "attitude," and according to which of two rival interpretations you pin your credulity to — for there are sects even among the weather wise.

"The moon lies like a boat there, dost see? That's a sure sign o' fair weather — there's a many as is false, but that's sure."

So says old Martin Poyser — father-in-law to the redoubtable Mrs. Poyser — in the 18th chapter of Adam Bede.

I have consulted my weather-wise friends in regard to this matter. Some agree with old Martin and some don't. But both parties agree that when you get your first glimpse of the new moon you must observe whether she is lying on her back or standing on end. Peter Paul says: "Canoe on end, hold 'um no water." So says Paul Peter. But one of them interprets this thus: Hold no water; that is, water all run out and come down; therefore, moon-on-end betokens rainy weather, and moon-on-back fine weather. This is the Martin Poyser view; and is (I think) the orthodox faith in England. But there is another way of reading the sign. Hold no water; that is, there is no water to come down; therefore, moon-on-end betokens fine weather, and moon-on-back foul. This, according to Jamieson, is the Scottish view. Which of these views is the correct one, I don't know. According to the scientific people they are — both of them — "lunar notions that are utterly absurd." It is to be hoped that the weather-wise will show that in this case the "absurdity" lies with the scientists, and that they will then settle among themselves which of the two contradictory interpretations is the true one. For this would be a beautifully easy way of foretelling the weather. Given the place for which the weather was wanted, and the time at which the observation of the moon should be made, it can be calculated — months or even years beforehand — just how the moon will stand or lie in the sky; and so we would be all ready for the fine or foul weather when it came. And even that is not all. By dint of some more calculation we could so judiciously fix the time of the observation as to make sure of always catching the moon when in the "attitude" that betokened whatever kind of weather we might happen to want. And that would be very nice. But if I should take my observation in the early afternoon when the moon was on end, and my neighbor should wait until evening when she was lying "sair on her back," then the poor clerk of the weather would be in a bit of a fix; wouldn't he?

In Belcher's Farmer's Almanac for the Province of Nova Scotia, at page 47, there is a "weather guide." It is in the form of a table, and professes to tell what kind of weather may be expected during the week after new moon, or first quarter, or full moon, or last quarter, according as these phases happen between midnight and 2 a. m., or between 2 and 4, or between 4 and 6; and so on to midnight again. A very useful table this, if the weather would only be good enough to regulate itself according to the rules given there. We are told that the table is "ascribed to Dr. Herschel," whoever he may have been.

A few pages further on in the almanac there are three paragraphs under the heading, "Forecasting the weather." Here is one of them:

"The earlier students based their predictions on the phases of the moon, but an examination of the Greenwich observations for more than half a century has shown that this theory is entirely unfounded. Weather prophets like Moore, Zadkiel and Vennor" [and Dr. Herschel (?)] "claim to be able to forecast the weather day by day for a whole year;" [the 'guide' claims only to do it week after week till the crack of doom] "but meteorological science in the British Isles, and the signal service of the United States, with the weather bureau of the Dominion, does (*sic*) not claim to forecast, with any certainty, the weather for more than three or four days at the most."

This seems to be rather an unkind cut at the "weather guide," for its predictions are "based on the phases of the moon." But the cut is made as light as possible by printing it in much less prominent type than the "guide" is printed in. Such, at least, is the case in Belcher for 1889, from which I have copied the above extract. Here is the 1891 one just come in. Turning to page 47 I find the "weather guide" in its usual place; but — whew! I can't find anywhere the other paragraphs, which used to shake my faith in the "guide," and which in the 1889 almanac appeared on page 53.

What does this mean? That "the Greenwich observations for more than half a century" are untrustworthy; that "meteorological science" must take a back seat; and that the weather must be left in sole charge of the "guide?"

The writer in *Longman's*, from whom I have already quoted, pays his respects to the precious "guide" in a paragraph which is too long for this month's REVIEW. A. CAMERON.

Yarmouth, N. S., January 2, 1891

For the REVIEW].

The Teacher's Work.

I noticed in the October REVIEW a communication signed "Cie-Cie" which I read with interest. I have found schools just as described — where pupils were well up in reading and had not been trained in all the other branches. But in my opinion teachers are not always to blame for this. Let an individual call at a respectable farm house in the country, and in the course of his visit inquire of one of the children how far he or she is advanced at school; the answer comes at once from parents or pupil: "In the fifth book," or "fourth book," and not a word is said about other attainments. People in the country seem to regard school as a sort of lottery where their children go occasionally to *try their luck*, sometimes with books and sometimes without them. It is a great pity that parents do not take a deep interest in schools and the welfare of their children. Some parents send their children to school only when they have nothing home for them to do—and then sometimes they will hire them out to other people—as though the time at school were wasted. People who would hire help and keep children at school are those who know the value of punctual attendance at schools. Again, there are those who will not provide books. I have a school now where there are pupils who have attended school during a whole term without all of the necessary text-books. I have done the best I could orally, and repeatedly ordered the books, but the answer comes: "Father says I don't want a geography," or "they won't get me any more books," or "they said they would get it when they went to the store again."

When teachers see this state of lethargy—or I am half inclined to call it wilful neglect—on the part of parents they are too apt to say: "Well, if people are so mean as to refuse to take an interest in this work why should I?" The only thing we can do is persevere. Let us do what we can. Let us make an attempt to follow the course of instruction—and if we fail we will have done our duty and the fault will not be ours. I could name a number of other discrepancies with which the teacher must contend, and which need no comment to prove the vast amount of injury they do. Meanwhile let us hope that the parents who have been educated under the school system of New Brunswick will have brains to lead them to provide for the wants of their children at school.

COUNTRY TEACHER.

In ungraded schools in country districts the teacher has to grapple with the whole course. Methods have been freely discussed, pro and con, and many plans have been advanced, but these should be varied as occasion requires.

The scholars must be interested in their work. They should be encouraged to talk and ask questions about the work to be performed; but care should be taken not to provoke controversy. A pupil should not be kept at one piece of work until he comes to dislike it. This is the cause, to a great extent, of idleness and inattention to lessons, and tends to disorder which drives method to the wall.

Teachers should inspect all work done by the children, pointing out any defects which may occur and commending where work is well done. Do not adhere too strictly to time tables. Do not run a school as a through train, but switch off occasionally, especially where it is agreeable to the scholar. Change of labor brings rest, and at the same time is an inducement to perform work that is dull.

Let the work be practical. There are few lessons in the course of instruction that cannot be made, more or less, applicable to every day life. A. M.

Professor Lawson, of the University of Dalhousie, is giving a course of evening lectures on chemistry as applied to some of the arts in Halifax industries.

Professor MacGregor, with an assistant, is giving a similar course in electricity and magnetism.

The Halifax Academy is adding to its scientific apparatus. The most interesting arrival during the last month was a first class articulated human skeleton.

For the REVIEW.]

Practical Chemistry.

BY J. BRITTAIN, NORMAL SCHOOL, FREDERICTON.

LESSON III.

(*a*). Here is the tube in which we heated the water; what is in it now ? The same water.

Yes; the water became warm and expanded; its molecules were forced farther away from each other, but they were not broken up. Hence, the water only underwent a *physical* change.

What did this tube contain before it was heated? Starch. How much starch does it contain now? None; there is nothing in it but carbon; the water has evaporated. The heat overcame the force of chemical affinity which was holding the atoms together, and the molecules were broken up. The starch underwent a *chemical* change.

You will remember, then, that any change which does not result in the breaking up of molecules is a *physical* change; while those which result in the breaking up of molecules already existing, or in the formation of new molecules, are *chemical* changes.

(*b*). In chemistry, an atom of carbon is represented by the capital letter C, an atom of hydrogen by H, and one of oxygen by O. The letter (or letters) by which an atom is represented is called a *symbol*. C is the symbol for carbon. The number of atoms in a a molecule is expressed by placing a small figure after, and a little lower than the letter. Thus, $C_6H_{10}O_5$ denotes a molecule of starch, and is called the formula for starch. The number of molecules, or of *separate* atoms, is expressed by a larger figure placed before the formula or symbol. Thus, $6\,C_6H_{10}O_5$ represents six molecules of starch, and 6 C means six atoms of carbon which have not yet united with atoms of some other element to form molecules of a compound substance.

LESSON IV.

Supply the members of the class with pieces of cork, clay, quartz, rosin, iron, copper, tin, lead, zinc. Let them scrape with a knife a small fresh surface on those specimens which do not already expose one. Direct them to place those which reflect light well — look bright or "shiny"—by themselves. The brightness, which all but the two first display, is called lustre. Ask the pupils to arrange those which possess lustre in three sets, placing together those which exhibit the same *kind* of lustre. The lustre of rosin is called *resinous;* that of quartz *vitreous* (Latin, *vitrum*, glass); that of the others, *metallic* lustre.

Let a pupil take a small glass tube in one hand and an iron wire, of about the same diameter, in the other, allowing each to project about two inches beyond the fingers. Ask him to hold them in the hottest part of the flame of the alcohol lamp, with their ends together. Tell him to drop the one which first becomes too hot to hold. The iron will be dropped first. How do we express this difference between iron and glass? We say that iron is a good conductor of heat, while glass is a bad conductor. Try similar experiments with wires or strips of lead, zinc, copper, and tin. It will be found that they are all, but not equally, good conductors of heat. What have you known some of these substances to conduct, or allow to passed through them, besides heat? Electricity, as in telegraph and telephone wires.

What three properties, then, are common to these five substances? They possess metallic lustre, and are good conductors of heat and electricity. They are all simple substances and are called *metals* or *positive elements.* Show the class specimens of gold, silver, mercury, sodium, potassium, and, if you have them, calcium and aluminum, and lead them to see, as far as possible, that they possess the properties which the other metals were shown to have.

The three properties by which we have now learned to recognize the metals depend on their relations to the physical agents — heat, light, and electricity, and are, therefore, *physical* properties. You will learn, however, to distinguish them from other elements by their *chemical* properties, which depend upon chemical affinity.

Patriotism — How Can it be Developed in Our Common Schools?

BY INSPECTOR BRYDGES, A. M.

(*Concluded.*)

There is left for me to say something upon what must be considered of far greater importance to the subject under discussion than anything else — that is, an accurate knowledge in the pupil of the vast extent of our territory, and its almost illimitable resources, its healthful climate, and the beauty of its natural scenery. In reference to this last, the following words of a great American author are applicable: "On no country have the charms of nature been more prodigally lavished. Her mighty lakes, like oceans of liquid silver; her mountains with their bright ærial tints; her valleys, teeming with wild fertility; her tremendous cataracts thundering in their solitudes; her boundless plains waving with spontaneous verdure; her broad, deep rivers rolling in solemn silence to the ocean; her trackless forests, where vegetation puts forth all its magnificence; her skies kindling with the magic of summer clouds and glorious sunshine: never need a Canadian look beyond his own country for the sublime and beautiful in natural scenery." But it is not so much the beautiful in nature to which the teacher has to direct the mind of the pupil as to the practically limitless extent of arable soil, the mineral wealth under it, the wealth of the forests above it, and the fisheries in the waters that surround it. So much of our resources has only lately been made known, and the growth of part of the country has been so rapid that our text-book on geography *does not furnish* us, at present, with sufficient data to place in the hands of our pupils in this direction. The live teacher, therefore, must look beyond this to statistics and recent articles in magazines to be able to create in our pupils a proper appreciation of our country. The report of the committee of the Canadian Senate for 1888, Erastus Wiman's article on the greater half of the North American continent, and some recent articles by C. H. Lugrin, of our Province, afford extensive information in this particular. I will now briefly review some of the more valuable of the resources of Canada, which every pupil should have some knowledge of before leaving our schools.

Let us consider for a moment the extent of her arable lands. In the Maritime Provinces, according to an official estimate, there are 18,000,000 acres, which is a little over one-half the full extent of this territory; of this amount, however, only 1,800,000 are at present under cultivation, or a little over one-tenth. In the Provinces of Ontario and Quebec there are 130,000,000 acres. In Manitoba and the various districts of the North-West there are situated 200,000,000, and in British Columbia about 50,000,000, making a total of nearly 300,000,000 acres. If we will add to this the enormous extent of country west of the McKenzie river basin, and north of the 54th parallel, which the committee of the Canadian Senate, upon careful inquiry, felt justified in reporting as adapted for the cultivation of wheat, but which, on account of its great distance from the centre of population, does not now occupy an important place among lands now offered for settlement, we would have an estimate of about 700,000,000 acres of land capable of cultivation, or just about the same amount as that of the United States. Surely there is room here for the overcrowded population of other countries. The Province of Ontario alone is almost as large as France, and exceeds, in extent of territory, the New England States, with New York, New Jersey, Pennsylvania and Maryland. While leaving out its immense forests, and minerals, and wilderness lands, it has an area which compares favorably in fertility with the most prosperous States in the Union, and its average yield of wheat in the five years ending in 1886, was greater than any of the States, with two exceptions; its total yield in 1887 being exceeded by only four States and one territory.

Speaking of the Canadian North-West, including the Province of Manitoba, a distinguished American statesman, the Hon. Horatio Seymour, is quoted as saying: "There is a country owned by England with greater grain and stock-raising capabilities than all the lands on the Baltic, the Black Sea, and the Mediteranean combined." The report of the Senate's committee in 1888 on the lands situated north of the 54th parallel in the valley of the McKenzie was as follows: That there is a possible area of 656,000 square miles fitted for the growth of potatoes, 417,000 for the growth of barley, and 316,000 for the growth of wheat. That throughout this arable area, latitude bears no direct relation to summer isotherms, the spring flowers and buds of deciduous trees appearing as early north of Great Slave Lake as in Winnepeg, St. Paul, Minneapolis, Kingston, and Ottawa, and earlier along the Peace River, where the climate resembles Western Ontario. When we consider that half the British Isles, Denmark, Norway and Sweden, and a great part of Russia lie within the same latitude, this should not seem remarkable. The idea that the climate of our North-West was the same as that of the eastern coast exposed to the polar current, has proved erroneous. In the year 1887, the handful of people then resident in the Province of Manitoba produced a surplus of 12,000,000 bushels of wheat, 7,000,000 of barley, and 1,000,000 of potatoes. This is almost incredible. But we have to take into consideration that every day there are two hours more sunshine for wheat; underneath, by the presence of frost, there is an exudation of moisture which feeds the tender roots of the wheat plant; that the soil is so rich that for twenty years wheat crops may be grown upon the same land without rotation; and also that it is an established fact that the further north wheat can be grown it is produced in its greatest perfection. The best wheat shown at the centennial exhibition in Philadelphia was grown in the Peace river valley. So much for the extent of our territory fit for cultivation, the greatest part of which is virgin soil ready for the plough.

Next in value to farm products comes the products of the forest. It is estimated that in twenty-five years there will be hardly any timber left in the United States; and, as Mr. Butterworth has pointed out, protection with regard to their forests there means its total destruction. Not so with our country, Canada, that possesses in her forests enormous wealth. Leaving out the great triangular prairie east of the Rocky Mountains, Canada presents, up the northern limit of the growth of trees, one vast forest area, except where it has been cleared by the hand of man. Nothing accurate can be given with regard to the money value of her forest areas. Practially speaking all the uncleared land in the five eastern Provinces to the extent of 300,000,000 acres is covered with a forest growth. In the North-West Territories it was shown in evidence before the Senate committee that the forests extended from the head of Lake Manitoba to the Rocky Mountains, a distance of a thousand miles. They were not able to ascertain the width of this belt, but felt warranted in reporting the growth was far in excess of the needs of the district, and of great prospective value to the treeless regions of Canada and the United States. In British Columbia the extent of forests is very great, and the growth the largest in our country. It is, therefore, certain that Canada is richer in her extent of forest areas than any country in the world, and can probably supply any demand put upon them for many years to come.

Let me say a few words with regard to the mineral wealth of the country. Take, for instance, that of coal, which it is almost impossible for a country situated in the cold temperate zone to do without. This mineral is found throughout the different Provinces of the Dominion in inexhaustible quantities. In the North-West, enormous coal fields are found from the shores of the Arctic ocean to the international boundary. It is said that Canada has 97,000 square miles of coal lands, and she alone has coal on the Pacific slope. Iron is found in all the Provinces of the Dominion in unlimited quantities, equalling in quality the Russian and Swedish, and adapted for every purpose that iron and steel are used for. Nova Scotia is the richest in iron ores, as they lie close to her great coal areas. New Brunswick has extensive iron deposits. In the Province of Quebec, near Ottawa, there is a hill estimated to contain 100,000,000 tons. Ontario has extensive deposits of a superior quality, and in British Columbia iron ore is found close by, and in connection with bituminous coal, of good quality, and all awaiting development. In her deposits of copper, Canada ranks, it is safe to say, above any known country in the world. It is found in many places in Nova Scotia. In the Province of Quebec, near Sherbrooke, large quantities are mined and sent to New York; and in Ontario, reaching close to the waters of the Georgian Bay, is the most wonderful copper bearing region in the world, possessing more of the ore probably than is known to exist in the territories of the United States. In this same region is also found extensive supplies of nickel. And, besides these, already mentioned, such minerals as asbestos, antimony, graphite, gypsum, salt, gold, and silver exist in large and paying quantities.

Just a glance at the wealth of our Canadian fisheries and I am done with the resources of the country. No country in the world can compare with Canada in this particular, and there is no limit to her wealth. The Hon. Peter Mitchell once said the fisheries of Canada, as a national possession, were inestimable; and as a field of industry and enterprise were inexhaustible. She possesses a coast line greater than any country in the world, far exceeding that of the United States; and, of course, far exceeding that of any European country. Bounded by three oceans, besides numerous inland seas, our Dominion possesses over 5,500 miles of coast line, washed by waters abounding in the most valuable fishes of all kinds, and from its position in the extreme north, will continue to hold its advantage over the fishery possessions of the United States. The Arctic seas, according to Prof. Hind, swarm with minute forms of life which, in many cases, form a living mass. This all-pervading life, which exists in these northern seas, carried down by the Arctic current, affords a source of food which gives sustenance to the myriads of fish which are found in the sea in our northern latitudes. This is but a slight review of our resources. But even in this, it is found that Canada stands *pre-eminently first* in its wealth of fisheries, and the extent of its forests; and fully equal to any other in her areas of land for cultivation, and in her mineral wealth. All that is needed is additional capital and additional population. A knowledge of the resources of our country surely cannot fail to awaken in our pupils a patriotic pride in Canada, *and I would emphasize this as means to the end* which we are seeking more than any other.

Now, it might be asked, if it is the duty of the teachers to guard against ideas of annexation springing up among the pupils of our country. *I would say emphatically*, No. No such ideas, I believe, *have gained any foothold* among us. It was Martin E. Tupper who said, "That very many *errors never would* have thriven but for very much *learned* refutation." This error certainly has not thriven, *and it is best* to leave it alone. Let our newspapers, if they will, pour forth the Greek fires of their sarcasm upon the spread-eagle oratory of Yankee politicians and the buncombe talk of their newspapers In declaring that our country is ripe for annexation. But it is not *for us to notice it.* Mr. Wiman says: In no part of the British Empire is loyalty to British institutions more pronounced than in Canada, and if there is any one sentiment that universally pervades the Canadian people it is this sentiment of loyal adhesion to British connection, pride in British traditions and personal devotion to the Sovereign. Charles D. Warner, a distingushed American writer, in his comments on Canada, speaks as follows: "Annexation, put squarely to a popular vote, would make little or no show in the returns, and there are forces strong enough to keep Canada for a long time on her present line of development *in a British connection.* And what is this British connection? It is the union of Canada and *other colonies, whose resources are but little less than our own, to the mother country by bonds which, though light as air, are strong as iron — the formation of an empire*, which, sixty years ago, the greatest American statesman characterized as a power to which, for purposes of foreign conquest and subjugation, Rome, in the height of her glory, is not to be compared — a power which has dotted over the whole earth with her possessions and military outposts; whose morning drum-beat, following the sun, and keeping company with the hours, circles the earth with one continuous strain of the martial airs of England."

That was sixty years ago. The enormous strides made in the advancement of the British empire during these years have been so great that even the resident of the United States, with all his boundless faith in the limitless capacity of his own country, is forced to-day to admit its progress has been surpassed by no nation on the face of the earth. Is it not right, then, that the pupil should have some accurate knowledge of the British empire, the territory it includes, and a general idea of its resources. It might even be well to lead the youthful mind to speculate somewhat upon the result of a closer federation of this enormous empire. The teaching of geography in the United States is different from the subject as taught among us There, in some of the States, at least, it is United States first, last, and all the time; and I am disposed to think that this has something to do with their great public faith in the capacity of their country. Mr. Warner, in his article, says that he once saw a map, colored according to the maker's idea of fertility, on which Canada appears little more than a green flush along the northern boundary of the United States. This probably is the ordinary idea in that country entertained concerning Canada — that it forms the northern boundary of the Union. We are more cosmopolitan in our ideas of this study. But if I were to suggest any change, it would be a little less minute teaching of the typography of our country, and decidedly more concerning the resources of Canada and the British empire.

In conclusion, I think it would be well for our teachers, in some slight way, to celebrate our public holidays; at least to teach the pupils to know why they are kept, and the history in any way connected with them; and I believe it would have an influence for good in inspiring patriotic feelings if, upon these holidays, the flag of our country might be seen floating above every school house. The exercises last 24th May at our Provincial Normal School, and the pleasure manifested by student teachers in their display of love of country and Queen form a happy incident in connection with our subject; and if the conscientious teacher would exert her or himself a little more along some of the lines here mentioned, greater results would be met with in this direction. Let us remember that we are developing the minds of those that are hereafter to become our statesmen, and direct the affairs of our country.

For the REVIEW.]

"Book Knowledge Indispensable."

In the December number of the EDUCATIONAL REVIEW, under the heading, "Book Knowledge Indispensable," I notice some remarks concerning language teaching in the German schools.

Let me quote : He (the pupil) must have an elementary knowledge of grammar, in order that he may express his ideas, with some degree of accuracy. To this end he must expend, at least, *four years* in our bookish schools."

It is generally conceded that children learn to speak and write correctly, by speaking and writing, and not by studying text-book grammar. Pestalozzi, Frœbel, Herbart and other educationists have striven to emphasize the importance of children being encouraged to use their senses, as in this way, they acquire the materials of knowledge.

In the German school the children are encouraged to express the ideas thus acquired in properly formed sentences and paragraphs.

Every recitation, under the direction, encouragement and criticism of the teacher, is an excellent exercise in language.

At the end of the recitation the pupils write down the ideas received from the lesson in their own words.

This written exercise is corrected by the teacher, who gives especial attention to the construction, punctuation, facility in expression, general neatness and penmanship.

The benefits which the pupils receive from the study of text-book grammar, as it is usually taught in the common school, are very limited, while too often the influence on the mind of the child is positively injurious.

For advanced students the study of text-book grammar is an excellent discipline.

"When the course is pursued which nature has indicated by the way in which she has secured correct speech ; when attention is directed to thought, of which language is the expression ; when sentences are analyzed with the view of gaining power to master thoughts therein ; when from the offices they sustain in speech, words are inductively classified ; and when from the relations which exist between words in sentences, inflections are discovered and their meaning ; then grammar takes its proper place in the school."

Text-books and "bookish schools" usually exercise a cramping and narrowing influence on teachers and pupils.

The following resolution, recently passed in the Provincial Teachers' Association in Ontario, may be quoted again : "That *technical grammar* should be removed from the public school programme, except in so far as it may be taught incidentally in a thorough course of practical language training."

In conclusion, I heartily sympathize with "Lady Teacher;" she is one of hundreds of honest, hard-working teachers who are looking for light,

This light will be found in *technical training* for *teachers*, fewer and improved text-books, and properly correlated courses of study. J. B. HALL.

Truro, December, 1890.

For the REVIEW.]

Kindergarten Methods in Primary Schools.

FOURTH PAPER.

Next day we talk about *square faces*. We find out by conversation with the little pupils how much they know about sharp corners, round edges, flat faces, straight lines, etc., and we call their attention to the top of the desk. (In Kindergarten the tops of the desk are marked off in one-inch squares). Perhaps they may have noticed the ruling of the desk, but their attention is now directed to it by the teacher, and she explains that some day we will have blocks to play with which will just fit into these places. Let us look at these little pieces of the desk which have straight lines all around them. Every side is the same length. All these little pieces, or spaces, are just as long as they are wide. A one-inch cube is given to each child, and each finds out that it exactly fits in one of the spaces. Several things are measured, as the teacher tells them each space is one inch long. They measure it to find out if it is as long as it is wide. The little cube's face which fits in this space so exactly must be just as long as it is wide. Some one may know the word *square*, but if none know the word is given. They now find objects in the room with square faces, and some which have not square faces. Some faces found may have to be measured before all the class is sure of them being square. The question comes up frequently, Why do you call it square? Because it is just as long as it is wide. Paper is given to the class to cut into squares, and at the close of the lesson pictures of square faces are drawn on the blackboard.

When the children are quite familiar with the cube we take up the *cylinder*. Its round face is first spoken of. We count the flat faces and compare them with the flat faces of the cube. We count all the faces and find that two flat faces and one round face make three altogether. We compare the number of the faces of the cylinder with the number the cube has. We compare what the cylinder will do with what the ball and cube will do, and each child finds out for himself that the cylinder will roll, stand and slide. Some one may call the flat face round, because of the round edge. A ball, cylinder, cent and round paper (circle) are shown to the pupils. We find that the ball is round everywhere, the cylinder has one round face and two round edges, while the cent and circle have only round edges and a flat face.

Although the word cylinder is long, it is quickly taken up by the little folk after they once hear it. They seem to be mastering something very hard to do, and rather delight in saying it after you have told them that the name of this block is very hard to remember and a very hard word to say.

Attention is drawn to how much of the cylinder can be seen as it stands in front of you, and I have known children who had never seen a drawing of a cylinder go to the blackboard and draw the top, two sides, and a curve for the bottom. Some find it very hard to make a picture of the cylinder, and so I would talk some time about what can be seen of it before I asked them to go to the board, teach them how to look at it so they have the outline in their minds before they attempt to make a picture of it.

We might close the lessons of the second gift for the present with one more lesson. I say, for the present, because we cannot exhaust one gift before we proceed to another. We introduce each gift and then take up another afterwards, returning to find something new in the old one.

Give to each a round paper to fit the top of its cylinder, and a square paper to fit the top of its cube. Compare the objects with each other, leading the child to clothe his thoughts in good language. Try the round paper on the cube and tell why it does not fit. Try the square one on the cylinder and tell why it does not fit. Ask each pupil to arrange the ball, cube and cylinder as he likes best, and have some tell you just how they have arranged theirs, as: "My ball is on top of my cylinder, and my cylinder is standing on my cube," or "My ball, cube and cylinder are on the desk side by side," etc.

Blindfold a child and ask it to feel the different objects you hand to him and to tell you what they are. This is most interesting, and you will see the little fingers feeling earnestly. Ask some to tell you how they knew it was a cube and the answer will be, "Because they felt it." Then we know that our hands are very useful. Ask one who is blindfolded to feel a colored ball and to tell you the color of it. Several will try because they are sure they know the colors even with their eyes shut, and only find out when they have tried and make a mistake. They know now that we cannot tell the color unless we see it, that we feel shape, but can only see color.

We find the children always interested in observing the difference between the ball, cube and cylinder, at rest and in motion. The sphere is always the same, whether at rest or in motion. The cube, as it revolves, becomes a cylinder, a double cone, etc. The cylinder looks like a sphere, a double cone, etc.

The second gift comes to us provided with the necessary staples and holes for suspending in the air.

Frœbel felt that this gift brought out the "law of opposites" more than any other.

The cube, sphere and cylinder taken together are the column in architecture; the cube is the base, the cylinder is the shaft, and the sphere the capital.

A monument made up of a ball resting on a cylinder, and the cylinder on a cube, stands at Frœbel's grave with his name and this inscription: "Come, let us live with our children." D.

(To be continued).

For the REVIEW.]

Interesting to Geological Students.

In some parts of Kings County and perhaps in other parts of Nova Scotia the sub-soil is found to be full of the stones or "pits" of the wild cherry. In these districts, land covered with forest primeval in which not a cherry tree appears, will, when cleared by the woodman's axe, or by fire, produce the thickest possible growth of cherry trees. Other districts will produce trees of other previously unknown varieties, doubtless growing in the same way from long-buried seeds. Is there not an interesting field here for the student? The appearance of our country hundreds, perhaps thousands of years ago,—the length of time for which seeds will retain their vitality, the nature of the preserving element and many other interesting subjects for investigation may be suggested by these facts. A pioneer settler in the "Big woods" of Minnesota informed me that in 1857, in digging a well, he struck, at the depth of twenty-five feet, a red, loamy soil, very different from the soil at a lesser depth. The next spring he was surprised to find that wherever this red soil had been deposited the ground was covered with plants of the white clover, though that grass was totally unknown in the vicinity. Are similar instances known in these Provinces? W.

Cornwallis, N. S., Dec. 25th, 1890.

These observations are very interesting. To make valuable observations, the depth of the cherry stones, the character of the soil in which they are imbedded, etc., should be most accurately noted. If living seeds are found deep in the soil, whether in gravel, drifts, boulder clays, or in other formations, it would seem to indicate that they are survivors of a previous geological epoch. By their observation and study, a portion of the flora of a post-glacial, if not of a pre-glacial period, might be reconstructed. Extreme precautions would have to be taken to prevent errors of observation.

There is no short road to a competent knowledge of history. The study must be pursued beyond the school-room and by the pupil himself.

Nova Scotia Educational Association.

The annual convention was opened on Monday evening, December 29th, in the Convocation Hall of Halifax County Academy, by the President, David Allison, LL. D., Superintendent of Education. Although the weather was not all that was desirable, the attendance was quite large. After the minutes of last meetings were read by the Secretary, A. McKay, Supervisor of the Halifax schools, a paper from Prof. F. H. Eaton, now in Berlin, on "the necessity of a Provincial manual training school for the Province," was read. This paper was printed in the Halifax newspapers, and attracted much attention. The school should be of the same grade as the high schools or academies, the academic studies being limited to English, civics, mathematics and science. The manual training should be drawing, modelling, scientific laboratory work, and a course in the workshop in wood and metal working. The course would thus fit the student for intelligent citizenship, and for the successful prosecution and development of our industrial arts.

The opinions elicited were thoroughly in favor of the principle, with a modification in detail favoring the affiliation of a manual department to each high school or academy.

The president next delighted the audience with a graphic sketch of the development and present state of education in England. His visit of a month or two this fall, following a visit a few years ago, gave him a good opportunity to note the character of late changes. The first lesson we should learn from the study of the peculiar English system is the folly of blind imitation; the second is toleration. For here, without any system of popular education in our sense of the term, the English people have shown a progress which is the admiration of the world. Then, so conservative are they of everything relating to the past, that when the spirit of the age grows with the efflux of time, the shreds of its ancient investment are retained. While the spirit changes the form still remains. He sketched rapidly the growth of popular education efforts, beginning with the Sunday-school movement of 1780, which had scarcely anything in common with Sunday-schools of to-day, except the day. Then referred to the efforts of Lord Brougham in 1816, of Lord Spencer, and Lord Althorp; and the commission of 1860 to investigate the educational systems of Germany, United States and Canada, etc., all of which led to Foster's bill of 1870. Then was laid the foundation of a state system which is fast absorbing private systems, Lancastrian and Madras, in their modern developments and denominational schools. The examination and certification of teachers, prescription of courses of study, are already largely in the hands of the government. Fees are yet required to be paid in England, when pupils are able to pay. In Scotland the last step in this direction has just been taken. He eloquently illustrated the tremendously great work which the London School Board is doing in educating the entail of thirty or forty generations of illiteracy in Darkest England. He showed how the heroic educationists of the London Board throw those of other boasted cities into relief as pigmies in their efforts to elevate the masses. For, instead of following public opinion they dared to lead it. They voted a piano for every school, although nearly every paper in London condemned it as extravagant; they replied by voting a swimming tank for the children in addition. The speaker referred to the attentions received from the educational authorities, among whom was Dr. Fitch, a visitor to our interprovincial convention of 1888. R. J. Wilson, Esq., Secretary of the Halifax Board of School Commissioners, in moving a vote of thanks, referred to the historical remains of the Madras and Lancastrian schools in Halifax; the former under the title "National" system, giving its name to the "National School." Principal Oakes, of Horton Academy, and Inspector Morse, of Annapolis, seconded the motion, which was enthusiastically carried.

Tuesday Morning.

Professor Andrews, of Mt. Allison, read a very able paper on "The Teaching of Method" or "Mental Gymnastics." The keynote of this remarkable paper, which we hope to summarize at some future time, was Physiological Psychology.

Professor Seth, of Dalhousie, followed with another able psychological paper, entitled, the "Educational Ideal," in which he beautifully pictured the natural development of the three-fold activities of the human nature — intellectual, æsthetic and moral; and laid great stress on the necessity of psychological study on the part of the teacher, and the advantage of the study of the elements of logic in the last year of the high school.

A. McNutt Patterson, Principal of Acacia Villa Seminary, Dr. Hall, Principal MacKay and several others followed in an interesting discussion on some points mooted.

The next speaker was Mr. W. Patterson, M. A., head master of the Royal Arthur School of Montreal, and convener of the Quebec provincial committee on Canadian history. On being introduced by the president of the association he announced the object of his visit to be an endeavor to secure the co-operation of the Nova Scotia Provincial Association in the preparation of a Dominion text on Canadian history, which would give every Province such a recognition as would unite the interests of all Canadians, irrespective of creed or nationality, and conduce towards the creation of a oneness of patriotic sentiment. A Dominion committee is already in process of formation to take the question in hand. Ontario will be represented by the Hon. G. W. Ross, M. P. P., Minister of Education; Quebec, by the Rev. Principal Virreau, of the Jacques Cartier Normal School, Montreal; and Prince Edward Island by Mr. J. O. Nicholson, B. A., Superintendent of Education.

At the conclusion of Mr. Patterson's address, a highly interesting discussion took place, in which A. H. Foster, Supt. of Education, Principal A. H. MacKay, Principal Oakes, Prof. McMechan, Revs. T. W. Smith, Robt. Murray and others took part.

The following resolution was unanimously passed:

Resolved, That the Provincial Educational Association of Nova Scotia has heard Mr. Patterson with much pleasure, and approves in general terms of his proposition regarding a Dominion text on Canadian history, and hereby recommends the appointment of a representative of this Province by the Council of Public Instruction on the Dominion committee on Canadian history.

TUESDAY AFTERNOON.

The afternoon session opened with a paper read by J. B. Hall, Ph. D., who has recently returned from Germany, where he has been for the past year engaged in a study of German methods as applied to education in that country. His paper, entitled, "Pedagogics of Herbart," was thoroughly technical and showed deep thought and ability.

The importance of psychological study was here again brought home to the teacher. We hope to present Dr. Hall's views more fully to our readers at another time. He was very enthusiastic in his praise of the German methods and of their results; and facts were quoted fully sustaining his views. J. F. L. Parsons, B. A., a former teacher and inspector, laid stress on "new teachers not turning scholars back."

PUBLIC MEETING TUESDAY EVENING.

This meeting was held in Orpheus Hall. The platform was well filled with the leading representative provincial educationists. Lieutenant-Governor Daley presided. The President of the Association, Dr. Allison, referred to the absence of Bishop Courtney on account of serious illness. The Secretary, Supervisor McKay, read a letter from Rev. Dyson Hague, regretting his absence through illness, and paying a high compliment to the Nova Scotian system, and referring to the academic system as the poor man's college, that which puts him really on a par with the rich. Rev. Mr. Saunders was the first speaker. His leading point was the desirability and the possibility of adding manual training to our system. The possibility was illustrated by what he observed at Woodstock.

Alderman Lyons, of the Halifax Board of School Commissioners, gave a very happy address, laying chief stress on the necessity of inciting a true citizen's interest in public matters, municipal, provincial and dominion.

Rev. D. M. Gordon laid special stress on manual training as an adjunct to our present system.

Hon. Attorney-General Longley, after humorous allusions to points made by previous speakers, called special attention to the importance of training the rising generation in good manners.

His Grace, Archbishop O'Brien, said too much self-conceit was the worst feature of educationists to-day. He called attention to ancient systems, beginning with that of Egypt, and rapidly sketched their great results. He described the philosophers of to-day, Spencer, Huxley, *et al.*, as jejune in comparison with the great Thomas of Aquinas in the dark ages.

No age has a monopoly of wisdom. Our present system was a labor-saving one; but too defective to last. It was only a system of technical education after all; for the soul should be educated more fully. He would restrict free education to the primary schools. His experience seemed to indicate that free education of a higher kind was taxing the poor man for the rich man's benefit.

Rev. J. A. Rogers, on account of the lateness of the hour, being now after ten o'clock, waived his right of speech, and was followed in conclusion by

Hon. Premier Fielding, who, with a pleasing fluency and masterly ability, gathered the threads of the discussion together. He thanked those who gave their friendly criticism, and referred with pride to a system so favorable to the poor that property should supply a free education of the best kind for all, even should the property holder have no children. He thanked the association for its efforts to improve our system; and intimated that the government would attach great importance to its decisions. That not only was the government ready to follow public opinion, but to lead it, when it was sure the action was in the best interests of the country.

WEDNESDAY MORNING.

Wednesday's closing session of the Teachers' Association was fairly attended, and a mass of important business was transacted. It is safe to say that this meeting has been the most important of any held since its inauguration. The deliberations were pushed to a conclusion rapidly and with a smoothness not always secured. The importance of some of the resolutions, which seem about to be carried into effect, will be far-reaching and of interest not only to the teaching profession but to the public at large. The President, in calling the meeting to order, reported that the revision committee on the course of study had not completed their work; but he submitted what had been done, with certain preliminary recommendations, which received the unanimous endorsement of the association.

(1) That provision be made in our educational system for the distinctive professional training of all teachers of public schools; (2) That the syllabus of examination for teachers' license be assimilated with the course of study for high schools, as revised; and it is suggested that third class grade D certificates be based as the subjects of the first year; second class certificates, grade C, on those of the second year, and first class, grade B, on those of the third year; (3) That in connection with examination for teachers non-professional certificates, the department of education be requested to provide for the issue of diplomas to graduates of county academies and high schools; (4) That as soon and as far as circumstances will permit, the various non-professional certificates should be taken seriatim; (5) That the professional training of teachers should be held to include fuller instruction in music, drawing, natural science, elementary logic and manual training than contemplated by the ordinary high school course.

A general discussion ensued, in which the following gentlemen took part: Principals Campbell, MacKay, Smith, Calkin, Congdon, Oakes; Professors Hall, D. K. Grant, Magee, MacMechan; Inspectors Lay, Roscoe, MacLellan and MacDonald, and the President, Dr. Allison. The fuller consideration of the course of study for the common schools was referred to a committee consisting of the Rev. Dr. McNeil, Supervisor McKay, Professor Oakes, Principals Calkin and MacKay. A short discussion, opened by Inspector E. W. MacLellan, LL. B., on the course of study, in which a number took part, emphasized the desirability of minimizing the study of geography, and not devoting too much attention to the detailed study of the United States.

Manual Training.

On motion of Principals Calkin and Campbell the following resolutions were unanimously adopted:

This Association records its high appreciation of Professor Eaton's paper on Manual Training, and endorses the general principles therein set forth We believe that a well devised system of manual training is of great value, both as a general educational factor and as a means of preparation for the various industrial pursuits; and we desire to see it form a part of our educational machinery. It is our opinion, however, that such a measure can be most economically carried out, not by the organization of separate and distinct institutions, but by incorporating certain lines of manual training in the high school curriculum. As the measure may be considered as to some extent tentative in character, prudence selects the suggestion of some one of these high schools as a field for experiment; and in our opinion the Halifax Academy presents the most favorable conditions for its introduction.

Further, As the scheme may well be considered as a matter of general interest to the whole province, and as its organization and its working involves considerable expense, it is the opinion of this Association that the local authorities should receive substantial aid from the provincial treasury.

The association viewed the idea of introducing manual training with favor, a strong expression of assent to its principles and a cordial recognition of the services of Professor Eaton, who has done so much for its cause, was given, as well as by Rev. D. M. Gordon and other speakers at last night's meeting. The reverend gentleman referred to the great pleasure he had felt in reading Professor Eaton's letter, and expressed the hope that the government would see its way clear to establish such an institution.

The National Educational Association

On motion of Principals MacKay and Congdon, it was decided to ask the council of public instruction to make such arrangements respecting next summer's holidays as would enable educationists to attend the approaching meeting of the United States National Education Association, which meets in Toronto in July next. The President expressed the hope that a number of the teachers would be able to attend, as he felt it would exert a splendid influence on all to meet such a vast assemblage of teachers from all parts of the great country to the south of us as would be in Toronto at that time. He also stated that he hoped to be able to work a plan by which a very low rate could be obtained from the railway authorities.

Closing Notes.

The executive committee of the association appointed for next year stands as follows: Principals MacKay and Freeman; Inspectors Lay, Condon, MacLellan; Miss Burgoyne and Professor (Inspector) MacDonald.

Mr. Patterson, Principal of Royal Arthur School, Montreal, who has been in attendance for the purpose of getting all the provinces to unite in introducing a Dominion History, instead of those now in use which are only sectional, requested the association to appoint a committee to act with other provincial committees in arranging for the preparation of such a book. The committee is as follows: Principals MacKay, Campbell and Oakes.

The usual votes of thanks were passed, when the President, in a few well chosen words, closed the association.

The time and place of next meeting were not settled. Possibly no association will be convened next year, as a number of the teachers wish to attend the "national" in Toronto.

N. B. Teachers' Institutes.

York and Westmorland County Institutes met just before the holidays—the former at Fredericton, the latter at Moncton, on Thursday and Friday, December 18th and 19th.

At the York Institute, President Rogers in the chair, an excellent paper on Reading and Composition was read by Principal Inch, of the York street school. From the *Gleaner* we take the following synopsis:

> Composition is interpreting thought into written language; reading is interpreting written language into thought. One should assist the other. The idea controlling the teacher should be, "Get the thought by the reading so that you can write in it your own language." Reading is not merely the fluent expression of certain sounds, though this seems to be the common method of teaching reading. Reading is getting at the writer's thought, as in silent reading. But there is another idea in reading, as it should be taught in the schools. It is the proper conveyance of the thought in language. The pupil then must be taught to get and to give the thought. But the getting of the thought is the first and most important step. Read ideas, not words. Expressive reading is, of course, important, but get the child interested in what it is reading and what interests it is usually expressive and beautiful. The child's talking tone ought to be its reading tones. Its reading ought to be the book talking. Development of the reading of ideas, not of words, in the young will lead them when older to enjoy reading, and to enjoy good reading, because they will be able to read easily. Composition should be considered an adjunct of reading. The young pupil should be taught to write as he would talk. Composition has been considered in the schools too technical, too literary, whereas it should merely be written talk. Many suggestions were given for subjects for writing, subjects taken from other studies, history, arithmetic, etc. But they should be all on something that the children know, and not on such time-honored themes as Faith, Hope and Charity, and such abstract ideas. In conclusion, he said, "In reading, aim to develop power to get the thought; in composition, use continuously the school subjects."

Over fifty teachers were enrolled. The officers elected for the ensuing year were: J. M. Palmer, A. M., President; W. T. Day, Vice-President; Miss Frances Ross, Secretary-Treasurer; Messrs. E. Everett, H. McKeen, F. Good, and Miss Clayton, additional members Committee of Management.

About seventy teachers were enrolled at the Westmorland Institute. President J. G. A. Belyea occupied the chair, and delivered a very interesting opening address on the "Necessity for Self-improvement." Papers were read as follows: "Arithmetic in Ungraded Schools," by Amos O'Blenus; on "Useful Knowledge," by Geo. J. Oulton; "Moral Teaching," by Miss O. Fairweather; the "Use and Abuse of History," by Miss Harper; on "History," by M. Butler. In the course of his remarks, Mr. Butler made reference to the ability shown by the nine-year old son of T. T. Landry, who was in attendance at his school in Memramcook. Although young in years, he possessed a knowledge that is remarkable. He is able to speak English and French fluently, can translate Latin, and has also translated many chapters of Cæsar, and is possessed of a knowledge of shorthand. A paper read by Mr. McDonald, on "Natural Science," concluded the topics for discussion. In speaking of science, Mr. Oulton referred to his course at the school of science last summer, and paid a tribute to the staff and the mode of teaching pursued. He recommended strongly that teachers take advantage of the opportunity offered by these schools. No money he had ever spent had brought him such returns as that expended in the study of natural science. The election of officers resulted as follows: Geo. J. Oulton, Dorchester, President; Miss Mary Fawcett, Westmorland, Vice-President; Chas. Avard, Lakeville, Secretary; Miss Lea Dumas and S. W. Irons were added members of the executive.

QUESTION DEPARTMENT.

E. D.—Please give solution (1) of question 7, page 272, Sangster's; also (2) explain, "The inhabitants of the tropics keeps himself cool on *rice*."

1. In our edition of Sangster (Lovell, Montreal, 1877), page 272, No. 7, reads: "In the foregoing question, A's gain was \$240 during 6 months, B's, \$800 during 12 months, and C's, \$400 during 15 months; and the sum of the products of their stocks and times is 34560.

Solution: A's gain in one month, \$40; B's, $66\frac{2}{3}$; and C's, $26\frac{2}{3}$. The stocks of each must be proportional to the gains for equal times. Therefore, A's stock : B's : C's :: 40 : $66\frac{2}{3}$: $26\frac{2}{3}$ (clearing off fractions) =120 : 200 : 80 (reducing to lower terms)=12 : 20 : 8=3 : 5 : 2.

\$3 stock × 6 months = 18
\$5 " × 12 " = 60
\$2 " × 15 " = 30

Total products of stock and time=108

∴ 108 : 34560 :: \$3 : A's stock, \$ 960
and 108 : 34560 :: \$5 : B's stock, \$1600
and 108 : 34560 :: \$2 : C's stock, \$ 640

2. The context, if we knew it, might aid in arriving at the author's meaning. Without it we can only say, we do not understand the way,

A man burned up with tropic heat
The scorching demon thus can cheat
By digging in a plate of rice
To reach its termination—ice.

W. T.—Can skeletons and anatomical models for teaching physiology be procured in Canada?

They can, we suppose. J. H. Chapman, corner McGill College Avenue and St. Catherine street, Montreal, have such supplies.

PERSONAL.

The delegation from the English farmers to Canada, headed by Colonel Stevenson, and accompanied by Hon. Mr. Longley, Attorney-General, David Allison, Superintendent of Education, and Professor Smith, of the School of Agriculture at Truro, visited the Halifax Academy and Dalhousie College when passing through the Province.

BOOK REVIEWS.

Annotated English Classics: The Ancient Mariner and Macaulay's second essay on the Earl of Chatham. Ginn & Co., Boston, publishers. Cheap and excellent reprints, in neat pamphlet form, with notes and explanations on the margin.

Old South Leaflets: The Bill of Rights, Federal Constitution of the Swiss Confederation, and other cheap reprints of historical and political subjects. Schools and the trade supplied by D. C. Heath & Co., Boston.

Shakespeare's King John, by Deighton. London, MacMillan & Co. and New York. This is another volume in the Shakespearian series that is being published by the MacMillans. The print is excellent, and the notes and introduction helpful to the student.

English Prose from Elizabeth to Victoria, chosen and arranged by Prof. Jas. M. Garnett, LL. D., of the University of Virginia; pp. 701, Price $1.65 Publishers, Ginn & Co., Boston. This contains some thirty-three extracts from the chief prose works of as many different authors, beginning with John Lyly's "Euphues and His England" and ending with Thomas Carlyle's "Hero Worship." The selections are excellent and will be well received by those who would make a brief study of the chief authors of the above named period. The true way to study a literature is by reading more or less of the works of authors, instead of critical notes upon them; and these selections, to which brief notes are appended, will enable the students to become well acquainted with some of the master-pieces of English prose.

Raise the Flag, and Other Patriotic Canadian Songs and Poems. Rose Publishing Company, Toronto. This is an excellent collection for schools. Mr. E. G. Nelson, of St John, contributes the poem mentioned in the title, and also that popular patriotic song, "My Own Canadian Home" A spirited poem, entitled, "Brothers, Awake," by Miss Aimee Huntington, formerly of Yarmouth, appears in the collection. Patriotic poems by Prof. Roberts and others are included.

Old Mortality, by Sir Walter Scott, in the "Classics for Children" series. Publishers, Ginn & Co., Boston. This is printed on good type, has explanatory notes for the young reader, and is attractive looking.

Catalogue of the Pictou Academy, 1890 Here we find not only the number of students but their names and addresses given. The proof of the value of the institution is not given in the great number and variety of university titles it offers to the faithful, but in the honors won by competition from other institutions, and the number of students it draws for a sound education—which number, during the past full year, reached near three hundred.

Post-Tertiary Deposits of Manitoba and the Adjoining Territories of North-Western Canada, by J. B Tyrrel, of the Geological Survey of Canada; Bulletin of the Geological Society of America, Vol. I., pp. 395-410.

The Stratigraphy of the "Quebec Group," by R. W. Ells, LL. D., Bull. Geol. Soc. Am. Vol. I., pp. 453-468. Pl. 10.

Notes on Nova Scotian Zoology, by Harry Piers. Trans. N. S. Institute of Science, Vol VII., Part 4 (1889-90).

The above three contain each valuable additions to scientific knowledge.

Intra-Ocular Syringing in Cataract Extraction, with a report of fifty-three operations, by J. A. Lippincott, B. A., (Dalhousie) M. D., Pittsburg, Pa., U. S. A., pp. 19. Reprint from Trans. Medical Society of the State of Pennsylvania. This extremely interesting paper contains drawings of very delicate and ingenious surgical instruments invented by Dr. Lippincott, one of the most successful Nova Scotians who do credit to the country abroad

Selections for German Composition, with notes and vocabulary, by Charles Harris, Professor of the German Language and Literature, Oberlin College, pp. VI. + 143, 5in. × 7in. Cloth. (Boston, U. S. A., D. C. Heath & Co., publishers, 1890). Typography superior. Pages 11 to 25, German originals with English paraphrase. Pages 25 to 57, easy narrative selections. Pages 57 to 75, letters. Pages 75 to 94, biographical, historical and descriptive selections for translation into German—the whole well annotated. Pages 99 to 138, vocabulary. Pages 138 to 143, list of strong and irregular verbs.

P. Terenti Afri Phormio, and P. Terenti Afri Heauton—Timoroumenos; texts with stage directions, the first by Frank W. Nicolson, A M, and the second by John C. Rolfe, Ph. D., Instructors in Latin in Harvard University. Prepared for use in sight reading. Paper, pp. 66, 7in × 5½in. (Boston, U. S. A., Ginn & Company, 1890). Typography superior. Prepared for sight reading in Freshman Class at Harvard. Just what is wanted for the advanced Latin in our best academies, where there is time enough for proper drill. The plays are good ones for acting, and acting is the best way to master the Latin idiom.

Open Sesame; poetry and prose for school-days. Edited by Blanche Wilder Bellamy and Maud Wilder Goodwin. Vol. II., arranged for boys and girls from ten to fourteen years old, and Vol. III. arranged for students over fourteen years. (Boston, U. S. A., Ginn & Company, 1891). Fine print, good selections, the "loyalty section" of which is more especially adapted to the United States, but there are masterpieces, representing many phases of literature, dramatic and narrative, epic and lyric, political and domestic.

Q. CURTI RUFI HISTORIARUM ALEXANDRI MAGNI MACEDONIS, edited by Harold N. Fowler with an introduction on reading at sight by Jas. B. Greenough; paper, about 100 pages. Publishers, Ginn & Co., Boston. The admirable introduction on sight reading should be in the hands of every teacher of Latin.

THE "Three Blind Mice Calendar" published by C. W. Bardeen, Syracuse, N. Y., price 50 cents, is one of the best hits in calendar publishing that we have seen.

BOOKS RECEIVED.

PHILOSOPHY OF AMERICAN LITERATURE, by Greenough White, A.M.; GOOD NIGHT POETRY, Ginn & Co., Publishers.

Current Periodicals.

The Christmas number of the *Argosy*, Mt. Allison Sackville, was a gem in its way among college journals. Its title page was exquisitely designed, and the contents creditable to its editors and to the University. ... The *Critic*, Halifax, independent in politics, but a "Greater Briton" to the core, besides being a good general weekly, has often capital educational editorial notes.... The *Acadia Athenæum*, both in form and matter, ranks among the best of college exchanges .The *Dalhousie Gazette* is becoming more than a college newspaper, although its has three departments of the University to report from. Its reports of legal decisions are worth more than its annual cost to the lawyer who would disdain to read ordinary university literature ..*The Cosmopolitan* (New York.) Henry George begins a series of articles on "Australia." No. 1 is very instructive and entertaining. "German Student Life," "Education in Public Spirit," its "Review of Current Events" are well written. The *Cosmopolitan* announced in December that it had reached a circulation of 100,000. It is admirably illustrated and its articles well written .. *Wide Awake* (Boston.) All the stories, poems and pictures of this month are of a high order, and it is unusually attractive. "The Wolves of St. Gervas," the opening story, and Boston's Girl Sculptor are of special interest. *New England Magazine* (Boston.) The illustrated article on "Bells," from a literary and historical view, is one of the greatest interest to readers ...The *Popular Science Monthly* has many articles of special interest to teachers, such as "The Peopling of America," "The Aryan Question," "Elementary Botany and General Education." The latter is admirable in its suggestions on teaching this or any other branch of science .. *The Century's* most striking features for the month is its selections from Talleyrand's long expected memoir. A sketch of Talleyrand by minister Whitelaw Reid prefaces the instalment....*St. Nicholas* has a very entertaining "Talk about Reading" by Charles Dudley Warner, an illustrated article on "The Great Industrial School" of Brooklyn, N. Y., and "The Boyhood of Michael Angelo," with others of great interest ...*Littell's Living Age* (Boston) began its one hundred and eighty-eighth volume with the number for Jan. 3rd. This standard weekly magazine grows more essential every year to readers who wish to keep abreast with the best current work in literature and science....*Garden & Forest* (New York) begins the new year with promise of greater usefulness to gardeners and horticulturists than ever.

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The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

FACULTY OF ARTS—(Opening Sept. 15th. 1890).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
FACULTY OF MEDICINE—(Oct. 1st).
FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.)
J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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The Educational Review *is published about the 10th of each month Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N. B.

EDITORIAL NOTES.

SEVERAL interesting communications and other matters are crowded out of this issue.

THE benevolent plan of Lady Tilley to establish a hospital for training nurses in connection with the St. John Public Hospital is meeting with a ready and generous response from all classes of citizens.

ON another page will be found the first paper of a lecture delivered by Moses H. Perley, Esq., in St. John, in 1841, and not before published. The introductory note is contributed by Mr. W. F. Ganong, to whom the readers of the REVIEW are indebted for the publication of this interesting chapter on our early history.

PROF. MACDONALD of Dalhousie University, who is well known as a very pleasing lecturer, and has a happy faculty in the choice of a subject, recently translated one of Lucian's dialogues before a Halifax audience in a wonderfully pleasing way, interlarding its practical teachings and humorous allusions with his own inimitable comments, which gave a spice to the whole that rendered it exceedingly enjoyable.

THE fare for the return trip from St. John to Toronto in July to attend the educational convention will be $20, to which will be added $2 — the association fee. Among other invitations extended are those to Right Hon. Mr. Mundella — Gladstone's Secretary of Education; John Stuart Blackie, of Edinburgh; Sir William Dawson, President of McGill University, Montreal; Rev. Principal Grant, Queen's University, Kingston; and other distinguished educationists. One evening session will be given to a comparison of American and Dominion educational systems — with Commissioner Harris representing the United States, and Hon. George W. Ross, Minister of Education for Ontario, speaking for the Dominion. Another evening will be given to a discussion of the education of women — the discussion carried on by six ladies, one for each of the four natural divisions of the United States, and one each for the Dominion and England.

THE headmastership of the Montreal High School is vacant. See advertisement in another column.

TH. H. RAND, D. C. L., who delivered the inaugural address at the opening of the arts department of McMaster University, Toronto, in October last, has spent two years in Great Britain and Germany, studying the systems of the leading Universities of those countries. The address is an excellent one, characterized by its broad and scholarly tone. We quote a few sentences:

> "Our aim is to educate men and women. I employ the term in a very serious sense, and wish to put large meaning into it. To educate means to evolve faculty or power, and a liberal education means the evolving, not of one faculty, but of all faculties; in general, the faculty of intellect, the faculty of emotion, and the faculty of right reason, which latter faculty assumes a healthy and disciplined interaction of the functions of intellect and emotion. A liberal education recognizes all faculties essentially human, developing them by exercise, and co-ordinating them in exercise. Power, efficient life, is the end sought. Organized energy is power, is life; and he who would obtain it can do so only by undergoing a discipline which both develops the individual faculties and co-ordinates them in harmonious action."

We are glad to find Professor Eaton present in spirit with us although absent in the German metropolis as to the body. In the Halifax *Herald* we have had several communications from him, forcibly calling public attention to the advantage of educational advancement. In his first he emphasized the importance of the immediate introduction of manual training into our public system, thus reinforcing the efforts so well initiated by Supervisor McKay, of Halifax. Again, he made a trenchant attack upon the system of licensing teachers without exacting from them a professional training for which a normal school has been called into existence and supported, thus supporting vigorously the policy which we understood our educational authorities had determined to carry out as soon as practicable. And lastly he has given the results of a visit to many of the technical schools of Great Britain, with the course of study pursued in each, asking, in conclusion, whether some of these systems in manual training that are working so successfully in the mother country might not be incorporated, with suitable modifications, into a Nova Scotian or interprovincial system of industrial education. These letters are the more interesting, as the Nova Scotia Provincial Convention unanimously recommended the introduction of something in this direction into our own public system.

Says the *Educational Journal* of Toronto: "When Sir Adolphe Caron, Minister of Militia, was in Toronto a few weeks since, he was waited upon by a deputation in which the Mayor and the City Inspector were included. The object of the deputation was to represent that there were in the Toronto public schools thirty-six companies of boys, who, it is claimed, are as well drilled as any of the volunteer regiments in Canada, and to request that these companies should be recognized by the Militia department as entitled to the usual government grant for equipment and drill instruction. Sir Adolphe said in reply, in substance, that he approved of the idea, and would advocate it before the government. Personally, he would like to give the boys of Canada a military education, such as that given in the schools of France, Germany, Switzerland, etc."

Good! Sir Adolphe. The military training of school children is one of the best forms of recreation. It is a splendid calisthenic for the physical personality; it is magical in developing the habit of orderly precision and prompt attention; and it marvellously tones up the tendency to flaccidity in patriotic stamina, which has marked the decay of every disappearing people. The boys from the Atlantic applaud heir comrades of Toronto.

The University of Toronto has decided to accept the leaving examination of the high schools as equivalent to their matriculation examinations. All the lesser universities will, of course, follow suit. We trust the educational departments of these provinces will not hereafter be too timid to take the step which will give us an authoritative leaving examination. Everything else is ready.

The students of Dalhousie University celebrated "George Munro Day" by an "At Home," which was attended altogether by nearly one thousand, from the Lieut.-Governor and Archbishop down to the freshman himself. The event made a decidedly greater impression on the public than the usual selfish drive and dinner. The arrangements were admirable. The refreshment rooms were always easily accessible; while a programme of music, song, or readings in different rooms, of scientific apparatus in others, experiments on light and electricity in the darkened physics room, and of chemistry in the chemical lecture room, etc., kept the ever promenading multitude very well diffused. The affair indicated a very high degree of managing ability; and it is generally hoped that the Dalhousie boys will continue in future so satisfactory a form of celebration.

Rev. James Anderson, M. A., government intructor in Tonic Sol-fa music for the teachers of Nova Scotia, has, during the month of January, visited the schools of Lunenburg, Bridgewater, Mahone Bay, Liverpool and Milton, and speaks enthusiastically of the efforts made by teachers and trustees to secure all the instruction possible and of the success obtained. In his tour, commencing in Amherst, and passing through Truro, Pictou and New Glasgow, and the localities above mentioned, a great number of teachers have taken the Junior certificate of the Tonic Sol-fa college. The following have taken the next higher certificate--the Elementary—which indicates a very practical knowledge of music generally as well as of the peculiar features of the new system: Principal H. S. Freeman, B. A. (Dal.), Amherst; Miss E. W. Poole, Truro; Miss Ada Travis; Miss Sarah Logan, Pictou; Head Master, Peter Fraser, Pictou; Head Master, Alex. McArthur, Pictou; Miss Lorna Zuline Pugh, Lunenburg Co.; Miss Mary G. Vans, Bridgewater; Miss Annie Crouse, Bridgewater; Miss Ida Jean, Bridgewater; Miss A. H. Hamilton, Bridgewater; Miss Maggie Dimock, Bridgewater.

The following have taken the third degree certificate — the Intermediate — which indicates a high degree of practical musical ability: Miss Ada Travis, Miss Mary G. Vans, Miss Annie Crouse.

In February Mr. Anderson expects to go to Lakeport and Shelburne.

Astronomical Notes.

How Far to the Nearest Star.

A correspondent says: "I read the following in a magazine the other day: 'There is a train that travels from London to York every day at the rate of fifty miles an hour. If that train ran from York to the sun, and never stopped, day or night, it would take over two hundred years to get there! But suppose it travelled on from the sun to the nearest star, it would have to rush on at the rate of fifty miles an hour for more than forty-six million years before it would reach the star? I wish you would tell us in the Review something about this, especially how one might work out such a sum for one's self.'"

The nearest star is Alpha Centauri. It is a first magnitude star in the right foot of the Centauri. It is the third brightest star in the heavens—only Sirius and Canopus being brighter—but it is too far south to be seen from this latitude. My correspondent wants to know how he might work out for himself the problem of finding how many years it would take a train, travelling continuously at the rate of fifty miles an hour, to pass from the sun to Alpha Centauri.

Let us assume, firstly, that we know the size of this earth of ours. We certainly do know it very exactly. I shall call its equatrial semi-diameter.

Assume, secondly, that we know the sun's parallax—the value of it, I mean. As to what this thing called "parallax" is, and how its value is found, I must refer you to the astronomy books. This is no place for enlarging on that subject. But if you will be good enough to imagine the axis of the earth to be sticking out for a hundred millions of miles or so beyond the north pole; and imagine the sun, at his mean distance, to be stuck on this produced axis like an orange on a darning-needle; and then imagine that the sun, so placed, there is a sea-captain testing his sextant for index-error—if you will do these things well you will lay a foundation for a clear conception of what the thing is that is called the sun's parallax. When a sea-captain tests his sextant for index-error on the earth, he measures the sun's diameter and finds it to be—not so many inches or feet or miles, but—so many degrees of minutes or seconds—not far from thirty-two minutes it is generally found to be. Let us suppose our Solar Salt to do the same thing with the earth. He measures the angular diameter of the earth as seen from the sun. He writes the result on paper and divides by two. This is the angular measure of the earth's equatorial semi-diameter as seen from the sun when he is at his mean distance from the earth. This is the thing that is called the sun's parallax. In this article I shall call it S.

It ought to be clear from what has been said that S can't be measured directly by anybody on the earth. But other small angles can be measured that are related to it, and from their measured values its value can be calculated. And from its value we can calculate the distance of the sun from the earth. This is only a problem in right-angled trigonometry. Call the distance R. This is the hypotenuse of a right-angled triangle, of which r (see above) is the perpendicular, and S is the angle between R and the bars. So we have

$$R = \frac{r}{\text{Sin. } S} = \frac{r}{S \text{ Sin. } 1''} \quad \text{because } S \text{ is very small.}$$

If you prefer it, you may take away Sin. 1″ from the denominator, and multiply the numerator by 206265 instead. To get R in miles, take the best values you can find in the astronomy books for r and s and work out the result for yourselves. For r use miles, for S use what you find which will be seconds.

Now for our star. Its distance, like the sun's, is got from its parallax. To find the sun's parallax is a very delicate job, but to find that of a star is a bit of celestial land-surveying far more delicate still. "The operation," says Prof. Young, of Princeton, "is, on the whole, the most delicate in the whole range of practical astronomy." In the case of the sun, the earth's radius is used as a base-line, and yet the angle subtended by this length of 4,000 miles is less than 9 seconds of arc, that is, less than the 200th part of the apparent diameter of the full moon. In the case of a star, the base line is the distance from earth to sun—a distance more than 23,000 times 4,000 miles—but, even so, the parallax is much less than that of the sun. Let us suppose it measured. We have now to find the star's distance D, knowing the base-line R and the parallax p.

Just as in the previous case we have

$$D = \frac{R}{\text{Sin. } p} = \frac{R}{p \text{ Sin. } 1''} \quad \text{because } p \text{ is very small.}$$

$$\text{And as } R = \frac{r}{S \text{ Sin. } 1''}, \text{ it follows that}$$

$$D = \frac{r}{p\, s \text{ Sin.}^2\, 1''} = \text{number of miles in star's distance.}$$

Now if we put v for the train's velocity per hour h for the number of hours in a year, and y for the number of years we want, we shall have, by ordinary arithmetical analysis,

$$y = \frac{D}{v\, h} = \frac{r}{v\, h\, p\, s \text{ Sin.}^2\, 1''} = \text{number of years required.}$$

And so you see that to find what we want we need only know (1) the number of miles in the earth's semi-diameter, that is, r, (2) the rate per hour of the train, that is, v, (3) the number of hours in a year, that is, h, (4) the star's parallax, that is, p, (5) the sun's parallax, that is, s, and (6) the sine of one second of arc. This last you can get from a set of mathematical tables, or, as I said before, you may drop $\sin.^{2''}$ out of the denominator and multiply the numerator by the square of 206265 instead.

With these six things given, it is only a matter of simple multiplication and division (or of addition and subtraction if you use logarithms) to find what is wanted.

To illustrate, let us take the Julian year as our year, and 3962·8 miles as the value of r, and $8.''848$ as the sun's parallax. (The Julian year is not our year, and these are not the best values of r and s, but I was asked to tell one how one might do the work for one's self and I don't want to spoil one's fun). If the star's parallax was 1 second, the number of years required by the train would be 43½ millions. But it is known that no star is so near as that. No, that statement is too strong. It is known that none of the brighter stars are so near as that, and no star of any kind is known to be so near. It was formerly supposed that the nearest one was as near as that, but later measurements of its parallax show it to be farther. The very latest, so far as I know—Elkin, 1883—makes Alpha Centauri's parallax $\frac{676}{1000}$ of a second, with a probable error of $\frac{27}{100}$. (This is not the best value, but I was asked, etc., see above). This means—supposing the value I am using to be accurate—that most likely our train would take a little more than 64 millions of years to get there, but it might be ahead of or behind time by about 2½ millions. So, to be sure of catching the passengers, the cabs might sometimes have to wait at the station for five million years.

A. Cameron.

Yarmouth, N. S., January 30, 1891.

Practical Chemistry.

By J. Brittain, Normal School, Fredericton.

Lesson V.

(*a*). Between 60 and 70 chemical elements are known. Here is a list of the more common ones, with their symbols. When the element is known in science by a name other than the common one, it is given in brackets:

Oxygen, O; Sulphur, S; Nitrogen, N; Fluorine, F; Chlorine, Cl; Bromine, Br; Iodine, I; Phosphorus, P; Arsenic, As; Carbon, C; Silicon, Si; Hydrogen, H; Gold (Aurum), Au; Platinum, Pt; Mercury (Hydrargyrum), Hg; Silver (Argentum), Ag; Copper (Cuprum), Cu; Tin (Stannum), Sn; Lead (Plumbum, Pb; Iron (Ferrum), Fe; Zinc, Zn; Manganese, Mn; Aluminium, Al; Magnesium, Mg; Calcium, Ca; Sodium, (Natrium), Na; Potassium (Kalium), K.

Those preceding hydrogen in the list are non-metals or *negative* elements. Those following hydrogen are metals or *positive* elements. To hydrogen is assigned a neutral position. It will be noticed that the names of nearly all the metals end in *um*, while those of the non-metals do not.

(*b*). We will now have some experiments with *compound* substances. Take the stopper out of the bottle labelled HCl, and hold the bottle with its mouth under your nose — not too close. The escaping *gas*, which irritates the mucous membrane of your nose, is the compound substance whose formula is HCl. The bottle contains a solution of it in water. Each molecule of the gas consists of one atom of hydrogen and one atom of chlorine. We can find its chemical name from its formula. A compound whose molecule consists of two kinds of atoms, as in this case, is denoted by the affix *ide*. The rest of the name is taken from the names of the two elements. Thus, the chemical name of this gas is *hydric chloride*. The word *hydric* shows that it contains hydrogen; the syllable *chlor* that it contains chlorine; and the affix *ide* that two different kinds of atoms make up its molecule.

Put a little water in the bottom of a small glass dish. Dip the end of a slip of litmus paper into the water. The paper remains blue. Dip a glass stirring rod into the solution of HCl in the bottle, and stir what adheres to the rod into the water in the dish. Do this three or four times. Then take a little of the mixture on the glass rod and taste it. It has a sour taste. If the sour taste is very weak, stir in some more HCl solution. Dip the litmus paper into the mixture. Its color is changed to red. What two substances were in the dish? Water and hydric chloride. Which turned the litmus red and had the sour taste? The hydric chloride: for we know water possesses neither property. Hydric chloride is called an *acid*. It is hydrochloric acid,— the muriatic acid of commerce.

Break one-third of an inch off a stick caustic potash, KOH. Notice that this is a solid white substance, and that its molecule consists of three different kinds of atoms, one of which is oxygen. Such compounds are denoted by the affix *ate*. The chemical name then is potassium hydrate. The first word is the name of the metal it contains, the letters *hydr* denote hydrogen; and the affix *ate* implies that the compound contains three different elements, one of which is oxygen.

Take about the same quantity of water as before, and drop the bit of KOH into it. Notice how readily it dissolves. Touch your tongue with a little of the solution. What do you perceive? A pungent taste. Dip into the solution the litmus paper which was reddened by the acid. Its color is changed to blue again. It must have been the potassium hydrate which produced this effect and had the pungent taste. It is called a *base.*

Now carefully mix the solution of the acid HCl and of the base KOH, stirring and testing with blue and red litmus paper as you mix them. When you have mingled them in the proper proportions, you will have a mixture which has neither a sour nor pungent taste, and which will neither change red litmus blue, or blue to red. How much of the acid is in the mixture? None; for there is nothing in it which has a sour taste or reddens blue litmus. Similarly, there is no base present. The acid and the base have *neutralized* each other.

Is there anything in the dish besides water? Yes; there is something in the water which has a taste resembling that of common salt. We will learn during our next lesson what this new substance is.

N. B. I shall, for the sake of brevity, often use the symbol of an element, which strictly only means an atom, and the formula for a compound, which properly denotes a molecule, instead of the *name* of the element or compound.

Euclid. Book II.

I.

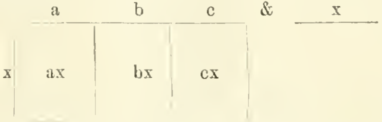
Euclid deviates from his general method in this book by demonstrating many of his propositions from nearly the same starting point in order to gain the advantage of a diagrammatic representation of the magnitudes compared. His method may therefore be called "the diagrammatic method." The logical method of the first book would allow a great contraction of the whole, as after the diagrammatic demonstration of Prop. 1, the most of the others require no diagram beyond the straight line and its parts mentioned in the enunciation. This neater and more logical method is called "the straight line method."

Geometrical notation was developed earlier than the algebraic, and accordingly has the more rude and cumbersome form. A line is named by the letters at the points at each end instead of by a single letter. As the algebraic notation at the present day is even more familiar to the young student of geometry than the older geometrical notation, there can be no loss of precision in demonstration by using the shorter and simpler notation, while there is a great saving in the effort of the eye to take in, and in the effort of the hand to write down, and in the time consumed.

Postulating, then, the algebraic notation, we proceed to give notes of an edition of the first ten propositions of Euclid II, more Euclidean than Euclid.

PROP. 1.

Particular enunciation: $(a+b+c+\&c)\,x = ax+bx+cx+\&c.$



(This proposition is proved diagrammatically as in Euclid. It is the fundamental proposition).

PROP. 2.

Particular enunciation: $(a+b)^2=(a+b)a+(a+b)b.$

Proof—

$(a+b)^2=(a+b)\ (a+b).$ (Definition of Square.)

$= (a+b)a+(a+b)b.$ (Euc. II., 1)

Q. E. D.

PROP. 3.

The rectangle contained by a line into one of its parts is equal to the square of that part, together with rectangle contained by the two parts.

$(a+b)a=a^2+ab.$

Proof— $(a+b)a=aa+ab.$ (Euc. II. 1)

$=a^2+ab.$ (Def.)

Q. E. D.

PROP. 4.

$(a+b)^2=a^2+2\,ab+b^2.$

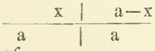
Proof— $(a+b)^2=(a+b)a+(a+b)b.$ (Euc. II. 2)

$= a^2+ab+ab+b^2.$ (Euc. II. 3)

$= a^2+2\,ab+b^2.$ (Axiom).

PROP. 5.

The rectangle contained by the unequal segments of a line when cut internally, with the square on the *mean distance* of the point of section, are together equal to the square on half the line.



$(a+x)\,(a-x)+x^2=a^2.$

Proof—

$(a+x)\ (a-x)+x^2=(a+x)a-(a+x)x+x^2$ (II. 1)

$=a^2\times ax-ax-x^2+x^2$ (II. 3)

$=a^2$ (Ax. 3)

Q. E. D.

(*Mean distance* is the old term for *distance from the middle point.*)

On the Early History of New Brunswick.

BY MOSES H. PERLEY.

A portion of a lecture delivered before the Mechanics' Institute, St. John, in 1841; now for the first time published.

Introductory Note.

The indifference of the majority of our people towards our local history, will inevitably be replaced in time by the deep and wide-spread interest to which its rich and varied character entitles it. In the meantime, however, material of the highest historic value is being lost, and it should be a pleasant duty for us to preserve such parts of it as may add to the glory of our people, or the knowledge of our race.

The manuscript which is to be printed in this and a few following numbers of the REVIEW, is one most worthy of preservation. Its writer was one of the truest sons that New Brunswick has yet produced; and he lived with her interests always near his heart. He was exceptionally well situated for the investigation of the period which the Ms. covers, both because of his near relationship to the leader of the first English settlement in New Brunswick, and his consequent knowledge of all the facts relating thereto, and also because he lived and was interested in these matters while many of the original Loyalists were yet living in St. John. No other man ever possessed such opportunities for the study of the early English and Loyalist Period in New Brunswick, and we cannot but feel that the manuscript below, embodies but a very small part of the knowledge which, could he have written it all, would have been so precious to us.

The manuscript includes two lectures; the first and about half of the second, treat of the period from 1492 to 1758, and having necessarily been largely compiled from printed works, contains little not to be found elsewhere. The portion printed below, and to follow, contains, we believe, material never before published; or at all events, not in an accessible form. The Ms. belongs to the author's son, Mr. Henry F. Perley, of Ottawa, and represents almost the only portion of his father's valuable papers saved from the St. John fire.

Moses Henry Perley was born at Maugerville, Dec. 31st, 1801. He was, through his mother, a grandson of Israel Perley, the leader of the Maugerville Colony as described below; and through his father, also named Moses, a grandson of Oliver, brother of Israel Perley. His early boyhood was passed at Maugerville, but he later received a common school education in St. John. He studied law and was called to the Bar in 1830.

From his youth he was very fond of the woods, and spent all the time he could spare from his profession with his gun and rod and Indian friends. He was a true lover of the forest, as the Indians knew when they made him their chief. He held several most responsible offices under both Imperial and Local Governments, and performed all duties in a manner most acceptable to the authorities and to the great advantage of his native country. He was a ready writer and most popular lecturer, his happiest theme being always "New Brunswick." He died in August, 1862, upon H. M. S. *Desperate* while engaged in official work off the coast of Labrador, and was buried with naval honors in the Episcopal burial grounds at Forteau, on the coast of Labrador, north of the Strait of Belleisle.

He had married in 1829, Jane, daughter of Isaac Ketchum, a Loyalist, and of their eight children, only one, Mr. Henry F. Perley, of Ottawa is now living.*

And now Ladies & Gentlemen, we have arrived at the period, when the settlement of this Province, commenced in right earnest, and the foundation of this glorious British colony, which is daily and hourly increasing in intelligence, wealth and prosperity, was first laid in a manner not to be again disturbed.†

In 1758, at the same time the last expedition proceeded against Louisburg, a British force was sent to take possession of this Harbour [*i. e.*, St. John.] This force, consisting of part of a regiment of Provincials & a Company of Rangers took possession of the ruins of the French fort at Carleton, and secured themselves there, in the best manner they were able, during the winter. After the winter had fairly set in, a party of the rangers under Captn. McCurdy, set out upon snow-shoes, to reconoitre the country, and ascertain the state of the French settlements, then very numerous on the River St. John. The first night after leaving here, they encamped on the side of a very steep hill near the present town plat of Kingston not far from the Belleisle. That night Captn. McCurdy lost his life, by the falling of a large birch tree, which one of the rangers cut down on the steep hill side — the tree came thundering down the mountain & killed Captn. McCurdy instantly. The party went on by the Belleisle, Washademoak Jemseg, and then along the bank of the St. John to St. Ann's Point (now Fredericton) where they found quite a Town. They set fire to the chapel, but a number of the French settlers gathered together, whereupon the rangers retreated, but being hotly pursued, they committed several atrocious acts upon people who fell in their way, to prevent their giving information. By reversing their Snow-shoes and making forced marches they got back safely to St. John. In the Spring of 1759 they rebuilt the Fort at Carleton which was then named *Fort Frederick* and respectable barracks were put up within it.

On the 30th Novr. 1759, Colonel Arbuthnot then commanding at Fort Frederick, wrote to the Governor of Nova Scotia, that 200 of the French inhabitants with two priests, had presented themselves to him, wishing permission to remain on their lands — their request was not however allowed.

In 1760 a party of rangers was despatched from Quebec under Captn. Rogers, to drive the French Settlers off the St. John. They performed the duty ferociously, ravaging the country & burning and destroying all before them. The French fled in all directions; Some of them making their way up the River toward Canada, were struck with the beauty and fertility of the country above the Grand Falls, and conceiving that they were not likely to be disturbed formed the settlement of Madawaska.

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* For permission to publish this Ms. as well as for these particulars as to his father's life, our readers must join the present writer in thanking Mr Perley. A more complete and more worthy sketch of Moses Perley's life will in due time appear. *W. F. Ganong.*

† We have throughout followed the original as closely as possible, even to retaining the punctuation and abbreviations. *W. F. G.*

From all that I have been able to learn of this foray of Captn. Rogers and his rangers, I believe, that the less that is said about it, the better. [*]

In 1761, Fort Frederick in this Harbour was garrisoned by a Highland Regiment. In this year, the Harbour of St. John was first regularly surveyed, by Captain Bruce of the Royal Engineers, and I will now show you a large map which I have had executed from his survey. [†] At this time the Provincial Governments became anxious to secure the possession of the River St. John, and prevent the French from resuming possession of its fertile banks. New England had also a particular interest in the matter, as numerous attacks upon their borders, by the Indians, were generally planned and fitted out on this River.

The Governor of Massachusetts, in 1761, dispatched an exploring party, for the purpose of ascertaining the position of affairs and the state of the country on the St. John.

The leader of that party was Israel Perley, my grandfather, who was accompanied by 12 men in the pay of Massachusetts. They proceeded to Machias by water, and there shouldering their knapsacks, they took a course thro' the woods, and succeeded in reaching the head waters of the River Oromocto, which they descended to the St. John.

They found the country a wide waste, and no obstacles, save what might be offered by the Indians, to its being at once occupied and settled, and with this report they returned to Boston. In May 1762, a party of about twenty, came to this Harbour of St. John, in a small vessel from Newburyport. Mr. Samuel Peabody, Mr. James Simonds, and Mr. James White, were the three principal persons of this party.

They arrived on the 19th day of May 1762 and landed at Portland Point, where there was a small clearing and the traces of an old French Fort.

(Mention the skeletons at Portland Point.)[‡]

Fort Frederick was then occupied by a company of soldiers from Halifax, the Highland Regt having left. Major Gilfred Studholme was the commandant; the second in command was Captain Butler, the grandfather of Pierce Butler, the husband of Fanny Kemble. The party of adventurers who had arrived from Newburyport brought with them from that place the frame of a house. They landed and raised it on the 20th May, and on the night of the 21st they occupied it. Mr. Samuel Peabody, to whom the house belonged, lived in it afterwards, and it was subsequently occupied by Mr. White (the father of our excellent sheriff,) for many years.

(To be continued.)

For the REVIEW.]

Notes for Teaching Music by the Tonic Sol-fa Notation.

ELEVENTH PAPER.

REVIEW OF THE PRINCIPAL POINTS IN FORMER PAPERS.

Those who study this notation and the principles to be observed in teaching it, will find it natural, simple, true and complete for all kinds of vocal music.

Be careful always to teach the thing to be taught, and only after this is mastered, give the sign.

Try to secure correct position whether the pupils are standing or sitting, and cultivate correct breathing and purity of tone. The mouth should be well open, and the vocalized stream of air should strike at the root of the upper teeth, not farther back in the mouth, which would produce a nasal sound. Let the teacher go round and ascertain whether each pupil sings in tune; if not try to bring him to do so. Do not allow him to sing with the class, but carefully listen until he can sing in tune. Justice to the class requires this; and thus the pupil will learn most quickly to sing correctly. The teacher should never sing with the class, except when he is singing a different part. Let him only sing when the pupils are silently listening to his pattern.

The first step consists in teaching the Doh chord. Do not ask the children to sing any of these three notes until they have learned to recognize first the d, next the s, then the d and s, and describe their characters. And now the pupils may sing the two tones after the teacher has patterned them softly. Get these sung in any order to the tone names and to the syllable lah, from the manual signs, or pointing on the modulator, and next from the signs or notes written on the black board. Remember to change the pitch of d frequently. Next get the pupils to discover the new note me, to describe it, to recognize it. And only then ask the class to sing it from the teacher's pattern, and at first only descending from s. After the pupils sing it with freedom they may sing m, passing from d to s. Always when the pupils sing a note correctly remind them of the character or mental effect. Ask them to think the note and then sing it.

In each lesson give some ear exercises.

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[*] An interesting confirmatory reference to this same event is to be found on p. 102 of "Notitia of New Brunswick," a rare and interesting book published in St. John in 1838. *W. F. G.*

[†] A copy of this map, probably the very one shown by Mr Perley, is now in the Crown Lands Office in Fredericton. *W. F G.*

[‡] Here and there through the Ms. are references like this—evidently subjects of side-remarks by the lecturer. *W. F. G.*

The second step consists of the three notes of the Soh chord. As in the former step, get the pupils to discover these, then to recognize and describe them, and afterwards to sing them from the pattern. Introduce the new notes at first only in chord exercises or passing notes. In all exercises with manual signs or on the modulator give variety in phrases as well as time; use musical phrases, and avoid getting into grooves along which the pupils can go even ahead of the signs or pointing. Work up any new or difficult phrases.

The third step consists of the notes of the Fah chord. Teach these notes in the same way as the notes in the first and second steps.

The teacher should not ask the pupils to go up or down the scale until after this third step has been taught. Time: Always get the pupils to observe the time in the teacher's singing and next to describe it. Then the third step is to sing from his pattern whether he is teaching single pulse notes, two pulse notes, three pulse notes, or half pulse notes, or three-quarter and quarter pulse notes. Make all the use possible of the accents strong, weak and medium in teaching pupils time. Only after the pupil can sing any particular rhythm give the notation, and only one new sign at a time. Never introduce for the first time more than one difficulty. In each case where there is a difficulty in an exercise (and there should be no *new* element in the exercise to be taught) teach not more than one measure at a time, and to one syllabe, so that the additional difficulty of tune is not introduced. Often it will be necessary to teach the exercise in half a measure, or even each pulse separately. Thus break up the difficulties into as small pieces as possible. It will often help the pupils to teach a more open form of rhythm, and when that is mastered in slow time, quicken the time up to required rate. Next take the time somewhat slower, but breaking as indicated in the exercise, and last work up to the time. This should be mastered apart from the tune, using only one syllable. Thus | d . , d : may be treated first in the form | d : — | — : d, next | d : —. d , and last | d ., d :

The time should be taught in the first three steps from the modulator or hand signs, and always any new or difficult interval in the same way.

Sing any passage not more quickly than can be done with ease.

In vocalizing or singing to the open syllable lah (which should always be done before singing to words) try to get the pupils to sing looking to the notes and thinking them. They are very apt to sing entirely from the memory of the tune, and so by ear, not from the notes.

Sing the words after the pupils are familiar with them from being carefully read over and explained. Let the teacher remember that there are many difficulties involved in singing words to a tune. These are only some of them. The pupils require to look at the notes, think the tone, look at the time, measure it in their mind, sing the tone in tune and time, and without the aid of the tone name; to think of the word or syllable and fit this to the right tone, and give it the due time.

Require the pupils to sing even the simplest songs with expression. But note that the mechanical part of expression should be taught in connection with some simple exercise that has been thoroughly mastered, such as the scale, or easy elementary rhythm. Let the teacher be satisfied with what most will consider slow progress. Master each new point before introducing another. JAMES ANDERSON.

For the REVIEW].

Kindergarten Methods in Primary Schools.

FIFTH PAPER.

Any one who has watched children at play must have observed the destructive tendency which seems natural to them. Girls break up their dolls "to see the inside," and boys their drums. When once the toys are broken they are discouraged and baffled because the pieces will not go together again. Frœbel, after a careful study of these facts, was forced to the conclusion that the so-called destructiveness of children is simply "perverted constructiveness," and that toys should be made so as to admit of separation into parts and reunion of these parts. Upon this he founded his *third gift.*

The third gift is a cube subdivided by three cuttings into eight equal one-inch cubes, each one representing the large cube on a smaller scale. It is presented to the child as a whole, and in the first lesson I saw given the teacher took a two-inch cube, with which the children were familiar, and tried to break it by pulling it apart. Of course it would not break. Then she gave them each one and they tried, but the hard wooden cube would not yield to the little fingers. She then told them to watch and see if she could break this one (touching a third gift which she had taken so carefully out of its box, in which it comes to the Kindergarten, that the cuttings were almost invisible at a little distance) and to their delight she separated it without any trouble. Then each of the little folk was given a box and directed carefully how to remove the box containing the cube so that the gift would stand as a whole. At once the idea of *the whole and its parts* was conceived by the child, and each at once noticed that he could build with this toy. It was seen that the little cubes were exactly like the large one, except in point of size, and the large cube was measured first and then the parts. Attention was drawn to the cracks in the large cube, and the way they went, up, down, back, front, etc. The words *above*, *below*, *behind*, *right*, *left*, etc., were used in describing the position of the little cubes, and then they made a chair as it was dictated to them.

"Take the right-hand front block with your right hand and place it on top of the right-hand back block. Take the left-hand front block with the left hand and place it on top of the left-hand back block." This made a chair, and then a conversation was held about what chairs were made of and for what they were used. Some went to the board and tried to make a picture of their chair, but found it hard to do. They were allowed to make anything they wished at the close of the lesson for a few minutes, and then the cubes were arranged in the form of a large cube again. Each placed his third gift as a whole into its own box.

There are three kinds of forms made with this third gift, *forms of life* (representations of objects which exist); *forms of knowledge*, affording instruction in number, form, and proportion; and *forms of beauty* (perfect models of symmetry and order.)

No matter what *form of life* is built we have a chance of developing ideas and of a language lesson. If we build an engine or a stove we might have an instructive lesson on iron; if a well, about water and its uses; if a church, why people go there, etc. There are forty forms given in "Paradise of Childhood," and children will often give a name to a form which is quite original.

By *forms of knowledge* or mathematical forms we teach addition, subtraction, and (with older pupils) multiplication and division. Let me say here that the teacher of Grade I who once uses this third gift in her number lessons will wonder how she ever did the work before without it.

Since the cube is given as a whole the principles of proportion are easily taken in by the child. The teacher, lifting the upper half of the cube, asks, "Did I take the whole cube in my hand, or did I leave some on the desk?

ANS.—You left some on the desk."

"Have I as much in my hand as there is on the desk?"

A.—"You have just the same."

She then tells them that things just the same, or alike, are called *equal*, and when the cube is divided into two equal parts each part is called *one-half*.

The teacher asks, "Where are the two halves of my cube?"

A.—One is in your hand and the other on the table.

All see that they have two half cubes, or one whole one when the two parts are put together.

The lessons proceed slowly, and many exercises are given before the words quarters and eighths are gained.

The *forms of beauty* are symmetrical forms arranged around a centre and represent no real object. Their regularity makes them pleasing to the eye. Having a third gift before us we take away the right back block and place it at the back on the desk touching at middle, the left front one and place it in front, the right hand front at the right side, and the left front at the left side. This gives us a form with four cubes as a centre.

There are a great many forms of beauty.

This gift cultivates the powers of observation, makes skilful hands, and increases the inventive power. A great deal is made of invention, as here the child must be thoughtful and attentive.

"The child's special talent or ability must manifest itself in this training. Children enjoy only what they can utilize for their own needs, and this divided cube, with all its possibilities of imagination and instruction, places in the child's hands an elastic plaything that will yield to many of its fancies. D.

For the REVIEW.]

Kindergarten Work in Hillsburgh, N. S.

Early in June last, chiefly through the liberality of a few leading citizens, a Kindergarten school was opened in this town in a new and commodious room under the efficient care of Miss Bertha Rice, who, to a natural aptitude for such work, has added the qualification which results from careful training at Truro.

A number of parents availed themselves of the opportunity thus afforded of having their little ones trained in a system of instruction which is now generally allowed by educationists to be of great benefit both morally and intellectually, but the advantages of which have hitherto been almost wholly confined to large cities. The number of children entered at this school was not large, for parents who do not understand its method and purpose are often slow to approve and make use of it, not recognizing the fact that it is a valuable aid to the discipline and training of home, and is an efficient help to the subsequent instruction of the primary schools. However, some fifteen pupils enjoyed the advantages of this school.

The work done was the ordinary Kindergarten work, which seems like a compromise between play and study, and so dexterously were the children led along from day to day that they were studying without knowing it, learning many things of importance, forming habits of observation and inquiry, and having the eye and hand trained by a method which seemed to them amusement, but which was really a careful discipline. On the evening of December 22, 1890, a review of the work done during the past seven months was held, and a large number gathered, drawn by interest or curiosity, and it was soon evident that curiosity gave place to satisfaction, and that interest deepened into approval. The exercises of the evening would not, perhaps, to an unpractised eye reveal the full significance of the teacher's labors, but they certainly created an impression very favorable to Kindergarten work in general. The children performed their parts with an ease and self-possession which, if they had acquired nothing else, would speak in praise of the system. The specimens of work done during the term showed great neatness, and though the exercises of the evening were not in the nature of an examination yet enough could be plainly seen to make it evident that the past seven months had been well spent.

At the close of the exercises addresses were made by H. H. Chute, Esq., M. P. P., and by Messrs. Willard Clarke and Alpheus Marshall, in which they expressed in clear and forcible terms approval of the work already done, and a hope that it would be continued, and that the time was not far distant when the Kindergarten would be incorporated in the system of public instruction.

Since holidays the school has resumed work as a Kindergarten primary. REV. W. C. BROWN.

Physical Geography in the Public Schools.

BY EDWARD MANNING, M. A.

It is strange that with all our progress in school methods, the teaching of geography is still complained of, and its results unsatisfactory. On the continent of Europe, indeed, they manage these things better. The study ranks equal to the classics in the German realschulen and the French academies. Among reasons for the complaint are, the common faults of inferior teaching — to be referred to later — the dryness of many text-books, the want of sequence in the subjects, and the omission to connect geography with physics and history.

In fact the study of geography will always be dry, unless physical geography is the basis of its treatment. But if this be rightly done, all is changed. It is recognized as related to all the natural sciences. As Geikie says: "It ever looks for a connection between scattered facts, tries to ascertain the relations which subsist between the different parts of the globe, their reactions on each other, and the function of each in the general economy of the whole." It "studies the distribution of vegetable and animal life over the earth's surface, with the action and reaction between it and the surrounding world. It traces how man, alike unconsciously and knowingly, has changed the face of nature, and how on the other hand, the conditions of his geographical environments have moulded his own progress. With these broad aims, geography comes frankly for assistance to many different branches of science. It does not, however, claim in any measure to occupy their domain. It brings to the consideration of their problems a central human interest, in which these sciences are sometimes apt to be deficient; for it demands first of all to know how the problems to be solved bear upon the position and history of man, and of this marvellously ordered world, wherein he finds himself undisputed lord. It borrows freely from all the natural sciences; but the debt is not all on one side. Save for the impetus derived from geographical research, many of these sciences would not be in their present advanced condition. They gain in vast augmentations of facts, and may cheerfully lend their aid in correlating these for geographical requirements."

With geology the connection is so intimate that the narrow view of its definition which will be chiefly adopted in this paper, reckons it a department of this science. As for chemistry — the earth is the great storehouse and laboratory of its elements and compounds, and the great theatre of its forces. Mathematical geography — a division of physical, is for all of us the chief and for many of us the only chapter of astronomy. Then again the ocean, air, clouds, form the studies of the meteorologist; as the plants, animals, and human races are of the botanist, zoologist, ethnologist, and biologist.

And the science is not only the bond of union of the natural sciences, but the bond of union between these and the human, mental, and historical sciences, as well as the basis of the latter class. As old Hakluyt has said: "Geography and chronology are the sun and moon, the right and left eye of history." Think how naturally the sterility and central position of Arabia's deserts, ere the sea had become a highway instead of a barrier, led her swarthy sons to the caravan trade; how the want of *land* marks led to the search for *sky* marks, and thus to infant astronomy, just as the floods of the Nile, obliterating landmarks, originated geometry, that is, land surveying; how the narrow Mediterranean, with far reaching promontories and island stepping stones, proved the nurse of infant trade; how trade's timorous groping from cape to cape led to the coasting of Gallic, Britannic and Baltic waters, till it spread its white wings for further flight, and finally lighted on the New World. Think again, how, when Asia Minor and the friendly Cyclades had pointed the way to Greece and Italy, the tender germ of Aryan progress there was sheltered by Balkan and Alp from northern blasts and northern marauders lest it should be untimely blighted in the bud. And when too genial climes had enervated the races thus favored, and the rough races of the forests beyond at last broke through; how, as Hughes says: "From the contact of the north with the south — the latter represented by a people who had grown up amid the most advantageous circumstances of nature under a bright and glowing sky, and in a genial climate — the former by tribes who had attained their maturity under the more bracing influences of a colder temperature and a less attractive aspect of nature — sprang the mingled strength which exhibited itself in such various forms of intelligence and activity, and which, through the storms and darkness of the early portion of the middle ages, prepared the way for the triumphs of genius effected at a later time. The result of these combined influences is exhibited in the artists and architects, the poets and philosophers of mediæval Italy, and in the commercial enterprises of Venice, Genoa, and Pisa, and others which clustered around her shores." In this connection, it has always seemed the irony of fate that the land which gave birth to Columbus, Vespucci, Verazzani, and Cabot should never have owned a foot of that New World to which they led the way.

But if physical geography is so important, how is it that it no longer enjoys the prominence it formerly had in school curricula? The reason is, perhaps, that the subjects grouped round it are now more minutely differentiated.

As to methods in teaching it. Instead of a vain attempt to lay down any complete system, would it not be more serviceable to indicate a few salient points of what to avoid and what to aim at? Under the first head is to be classed the *attempt to do too much.* One school geography in my possession contains 660 pages. Think of attempting to learn that amount in one of about eighteen departments of school study. This is becoming a serious question. The papers contain this week the appalling statement that about 300 students in the Prussian schools have committed suicide within the last five years, and the cause is largely traced to overpressure. The thing is simply monstrous. Rather than this one would fain go back to the careless time,

> "When first in woods the noble savage ran."

The thought is too positively painful to dwell on.

The next fault to avoid is that of *second hand;* giving judgments on the authority of others' statements, without the enquiry that makes them valid and valuable.

Third, the *slavery of the book,* instead of, at least, supplementing it with those references to nature all around us, which are so easy, so obvious, and yet so rare.

Fourth, the *premature presentation* of what cannot yet be assimilated by the scholar's unripe mind.

And last, but not least, the everlasting telling instead of teaching, the *didactic disease* of the pristine race of schoolmasters rather than teachers.

Now, having marked out the rocks and shoals in the course, the channel between is our proper way. This channel is indicated in our normal school instructions on method, which again are applied in our prescribed syllabus; so, instead of recapitulating them here, it will be better to glance at a few guiding principles.

Every effort is required to strengthen the *weak point* in the study of geography, namely, its want of sequence. For this purpose the aid of association and contrast, that of the connection of causes and effects, of experiment where possible, and especially of generalization, is to be earnestly sought. But be careful not to generalize too boldly, as is done occasionally even in text books. Thus Milner makes the broad statement that the heaths are actually confined to the Old World and the cacti to the New. Whereas we know that though heaths are rare and unimportant in this hemisphere, and an English visitor to Boston at once remarked on their absence in the neighborhood, yet they are by no means unrepresented here; while as to the cacti the Encyclopedia Britannica only ventures to say that they are almost entirely if not exclusively native to the Western World. Forearmed with this caution, however, the teacher will do well to generalize and thus group his facts. Take a few well-known generalizations with regard to the earth's reliefs and contours, and see how much they involve.

1. The eastern continent is consolidated and most massive in the north temperate zone, while the western continent stretches north and south through four zones. 2. Both narrow down southwardly to a rocky point, with islands or shoals as appendages, having a large island or group of islands to the east. Their chief peninsulas follow the same plan. 3. A remarkable parallelism exists on both sides of the Atlantic, the projections of one side answering to the indentations of the other. 4. The great land masses are grouped in three double continents, united by an isthmus or an island chain, with an archipelago on the east and a great peninsula on the west. Thus the Americas form one, joined by the Darien isthmus, with Old California on the west and the West Indies on the east. Europe and Africa, a second pair, having Italy and Sicily for their connecting link, prolonged as this is by the shoals which divide the *Mare Internum* into its two basins, (on which shallows, as you remember, Æneas came to grief,) having the Iberian peninsula on the west and the Grecian archipelago on the east; lastly Asia and Australia form a third, with the Malay peninsula and Sunda Islands for a link, having Hindostan on the west and the Malay archipelago on the east. 5. The three northern continents are deeply indented by the sea, while the southern are iron bound. Hence in ease of communication and all that it implies, the north is the favored hemisphere; and hence, this has been, is, and will ever be the chief scene of the great human drama, though the twentieth century — soon to dawn — will see the children of the south act a far more important part than hitherto. 6. Remarkable differences exist with regard to the Old and New Worlds. In both, as in all the great land masses, we find two unequal slopes culminating in a ridge, always nearer one coast. In the Old World the long slopes are towards the northwest, in the New towards the east, thus having their long gentle slope to the Atlantic and Arctic, and the short, steep one towards the Pacific and Indian Oceans. . . . "In this point of view," Guyot says, "these two great oceans appear as two basins of different geological character. The Pacific seems an immense basin which has sunk down, and whose high and ragged edges present on all sides the abrupt termination of the continents. It is on this line of fractures on the borders and all around this ocean that we behold the great majority of the active volcanoes of our globe arranged like an immense burning crown. The Atlantic, on the contrary, seems a simple depression in the form of a trough, owing perhaps to a lateral pressure, and partly to the tilting motion which lifted up the lands in the neighborhood of the Pacific. Hence its narrow breadth, the valley form, the absence of numerous islands in the interior of the basin, and the descent of all the neighboring continents by gentle slopes." 7. In the distribution of mountains, plateaus and plains there is a remarkable difference between these two great continents. In the old world the highlands predominate, but in the new the lowlands; and whereas the lowlands of the old world are of less service to man from aridity or cold, those of the new are the best portions of its surface 8. With regard to the oceans, the Pacific is marked by land-locked seas, the Indian by open seas, and the Atlantic by inland seas. 9. With regard to the winds, the rule is given by the oceans, while the local circumstances of the continents cause the exceptions.

Dana's generalizations as to the continental reliefs may be given here. 1. The continents have generally elevated borders with a basin-like interior — the highlands being more massive on one side. 2. The higher border faces the larger neighboring ocean. 3. He also compares the ratio between the size of the Alleghanies and that of the North Atlantic to that between the size of the Rocky Mountains and that of the Pacific; and again the ratio of the Rocky Mountain region to that of the North Pacific with the ratio of the size of the Andes to that of the South Pacific. 4. He sees in the case of the Altai and Himalaya a similar relation to that between the Andean system and the secondary American highlands. He might have instituted a third instance in the highland masses of northern and southern Europe; a fourth in those of east and west Africa; and a fifth in those of east and west Australia.

He also gives the following observations about the contours of the continents: 1. That the prevalent trends of coast lines both in continents and in island groups are towards N W. by W. and N. E. by N., meeting at right angles. 2. That where deviations occur they are mostly in curves. 3. The longest lines of coast lie on or near the wooden horizon of a globe when its poles are alternately elevated 23° 30′; or in other words that they form great circles, tangential to the Arctic circles.

Now, if any think these generalizations vague, if not puerile, let them thoughtfully follow out the probable effects of any great alterations in some of them. Think, for instance, what would result if the wide Pacific were placed where the narrow Atlantic now lies, or if the two coasts of this continent changed places, and America turned her back on Europe literally, as some of her more foolish children propose to do commercially, and heaved her Andes right athwart the way of infant colonization — or if the long cordon of narrow seas which happily separate the triple series of northern and southern land masses were removed to the northern coasts, giving a far vaster Sahara in the east, and perhaps one in the west to match it; how mightily would man's fate be changed!

This principle of comparison and association may be carried out in numberless other directions and link facts at first sight unconnected. Thus our gulf stream has its analogue in the *Kuro Siwo* or "Black Stream" of the Pacific, the Japan current. The equatorial current of the Pacific is deflected in a similar manner to the north-east, there, as here, it meets like ours an Arctic current flowing from Behring's Straits, which causes fogs in that sea like those on the "Bank," and give the same wealth of fish; for it seems also to be a general rule that the fish of cold waters are the most prized for purposes of food.

Wherever possible a fact ought to be coupled with every geographical name, and facts may be associated in other connections than that of cause and effect, on the principle of association. For instance: Our Province has one river of more than 400 miles in length, twice that number of half the length, viz., the Miramichi and Restigouche, and twice that number (4) of half that length again, viz., the Nepisiguit, Petitcodiac, Magaguadavic, and St Croix, each being about 100 miles. This makes seven independent rivers of 100 miles or more, to which may be added as many tributaries of our greatest, river also of about 100 miles each, viz., the Aroostook and Oromocto on the right, and the Tobique, Nashwaak, Salmon river (with Grand Lake and the Jemseg), Washademoak and Kennebecasis on the left. So with our counties. There are seven on the coast and the same number up the river, besides our own county, which belongs to each class And every county has some characteristics of its own. Northumberland is the largest, our own the smallest, Victoria is the most hilly, and Kent the most level, Charlotte and Gloucester, at opposite angles, contain the important islands, Sunbury is the oldest, and once included the whole Province, and Madawaska is the youngest, Albert is the richest in minerals, and Westmorland in marsh, York has the capital, and so on.

Again, a fact may be presented in a dull or in an interesting way A New Brunswicker engaged in setting up telegraph wires in S E Siberia, then recently acquired by Russia from China, described the climate to me as what is called extreme in these words: "The tiger and sable, the vine and the pine meet on the Usuri River." This is what is called the "art of putting things."

A few words about our manner of dealing with geographical names. It is to be feared that in the common sense reaction against the old etymological fribbling, the pendulum has swung too far. Much useful and interesting information clusters round proper names. How many traces of the old Celts in Europe live in the four river names, Don, Dour Avon, Uisge; the 14 Avons of Britain, the Adour, Derwent, Trent, Douro, Dordogne; the Usks, Axes, Esks, Exes, Ouses, Oxus, Oise, Iser "roiling rapidly;" the Dons. Tyne, Teign, Donau or Danube, and so on through a host of instances. We have in Acadia too our three Tracadies, each on the north shore, and the loyalists in each Province laid out their Kings and Queens counties, coupling them in the Island with the names of the reigning Sovereigns — just as the Catholics in Ireland laid out theirs, with their shire towns of Philipstown and Maryborough. Still more useful is it to mark the meanings of the names in physical geography, which are generally descriptive. There is a good list in the Globe Dictionary, which is classified and enlarged in my speller to a list of about 450, which might be useful.

Another great point to observe is the proper understanding of maps and map projections. The full understanding of mathematical geography is perhaps only to be gained in college work, but the foundations should be laid in school. The theory of the globular projection may be explained, but that of Mercator's Projection is still more necessary, why it appears distorted, and the great use it serves to mariners. Everything about a map should be made clear, even to such points as the *hachures* and *contour* lines; why, for instance, the north slope of the Cantabrians is darker than the southern, the northern *hachures* being darker because the slope is steeper. It is a sign of progress that we are attempting relief maps in a rude way. A very simple and effective expedient is to form the model of a continent or that of a locality on a horizontal black-board in dry earth or moulding sand. Asia makes a most interesting one, with its three huge plateaus and their mountain buttresses; those of the centre and southwest showing their three platforms, with the dividing ranges, and the Deccan with three also. The work takes some time it is true, but it would more than repay the trouble, and could be allowed to stand some weeks.

We could learn much from the way in which the press deals with the subject. Now and then a bright, breezy article makes us rub our eyes, as we see how fascinating the topic can become. Now it is a project to dam Lake Athabasca and throw its drainage with that of the Saskatchewan south into the Mississippi, now to shut up the Straits of Belleisle, now to flood the Sahara, and so trade with the Tuaricks and Tibboos of inland Africa. Lately the *Pall Mall Gazette* thus reflected on the last meeting of the *savans* of the geographical society. . . . .

"Suppose some philanthropic Gulliver, hailing from the larger air of Saturn, to be contemplating this Liliputian world from an arm-chair slung at a convenient distance out in space. As it spun round before him, like

> a papier-mache globe in a schoolroom, presenting to critical inspection each region in turn of its variegated surface, what would our philosophic Gulliver see? He would see (with the assistance of a powerful lens) a "luke-warm bullet" revolving with some minute signs of animation upon it. Regarding its area critically, as a microscopic landed estate, he would distingush about it something decidedly patchy. He would observe that while some small portions of it were laid out with excessive care as parks and gardens, there was a vast deal of this valuable property of which Providence has made over the entail to mankind, which we thriftless lords of the manor have let run to waste. Tropics choked with weeds, Saharas left dry and naked, with no provision to catch the fitful drenches of rain and turn them to account — the philosopher would shake his head to mark such signs of thriftlessness in the landlord of so scanty a domain — and one withal so water-logged. He would smile, too, a Saturnian smile, at the whimsical inequality with which a large and increasing family had treated the various portions of the land in settling down upon it. Here would be a scrap of dirt, standing up in a ditch a paltry thousand acres big, downright black and humming with Liliputians; such alarms, excursions, and agonies in acting; such plentiful buzzing to each other of progress and civilization and the like, such profound deliberations upon the destiny of the rest of Liliput and masterful ordering of the rest of Liliput to conform thereto! And right in the midst of one of such inconsiderable scrap, the British Association sitting to discourse of the future of humanity."

Surely the force of flippancy "could no further go!" A lukewarm bullet! Shade of Copernicus, what next?

Lastly, fellow teachers, our highest aim should be to rear on our instructions the fair superstructure of duty and of faith. There are those who claim that science will soon slay our beliefs. If this be so, I am glad for my part, that my sands are beginning to run low in the glass, so that I shall not need to grow too wise to die in the faith of my fathers. But no such fate is to be feared for our future. Attacks on faith are as old as the faith itself. Toland, and Chubb, and Hobbes had been swinging their bold maces of invective at revelation for half a century, and Bolingbroke and Shaftesbury had been stabbing it with their more dangerous logical rapiers, when the gentle Addison thrilled the nation's heart in the *Spectator* with the noble lines:

"Th' unwearied sun from day to day
Doth his Creator's power display,
And publisheth to every land
The work of an Almighty hand."

And again:

"Soon as the ev'ning shades prevail
The moon takes up the wondrous tale
And nightly to the list'ning earth
Repeats the story of her birth."

And an attentive ear can still, despite all the blatant discord of denial, hear our Mother Earth's great part also in this dominant fugue of the harmony of the spheres — the *Jubilate Deo*, the angels' song. Happy the ears that hear it? "For," our blind bard wrote of it,

"For, if such holy song
Enwrap our fancy long,
Time will run back and fetch the age of gold.
* * * * *
Yea, Truth and Justice then
Will down return to men.
* * * * *
And Heaven as at some festival,
Will open wide the gates of her high palace hall."

Nay, even the minor modulations are worth one's life to hear. She sings of herself also. of the subtle forces that run through her giant veins — electric, magnetic, chymic, centripetal; of the light and heat with which she is impregnated by her great solar consort, of her convulsive throbs when the earthquake fit rends her, of her gracious care of her offspring, the faithful register she silently keeps of them laid away in her bosom, and of the gentle love with which she lulls them to sleep in her arms at last!

Let us, then, if we would be true to our trust, and not offer a stone to the young hearts that look to us for bread, ever bring back our lessons to this primal truth, that though nature claims our admiration, our study and our reverence, yet the source and soul, the end and aim of all is GOD!

County Academy Entrance Examination.

GEOGRAPHY.

1. Explain the terms *bay*, *sea*, *river*, *tributary*, *channel*, *isthmus*, *volcano*, *latitude*, *longitude*.

2 Give the boundaries of New Brunswick, and give, as fully as you can, the *southern* boundary of the Dominion of Canada

3 In what direction from the nearest land are the following Islands, and by what waters are they surrounded: Newfoundland, Sable, P. E I Island, Miscou, Bermuda, Tierra del Fuego, Man, Sicily, Orkney, St. Helena, Tasmania, Ceylon, Madagascar, Vancouver.

4 From what countries do we chiefly obtain the following: Cotton, sugar, rice, silk, copper, tin, gold, grapes, tea, silver? and what are the principal productions of the West Indies?

5 Give a short description of the surface, climate and products of Europe

6. Write a note on any one of the following: Ireland, Australia, Brazil, Newfoundland, Egypt.

7 Give as definitely as you can the position of the following cities: St John, St. John's, Ottawa, Hamilton, Chicago, St. Louis, New Orleans, Glasgow, Belfast, Bristol, Copenhagen, Odessa, Melbourne, Calcutta, Cape Town, Rio Janeiro.

8. Name and locate the political divisions of Asia, with their capitals

9 Draw an outline map of North America.

USEFUL KNOWLEDGE.

(*Ten questions will be considered a perfect paper.*)

1. Why is a room full of people warmer than the same room when empty?

2. What is ventilation? Name some of the causes of impure air in a household?

3. What is meant by the "circulation of the blood?"

4. How is snow formed? Describe some of the forms found in snow-flakes? What is hail?

5. What is the "crust of the earth?" Define *fossil*, *clay*, *sand*, *shale*, *gravel*, *sandstone*.

6 What is the chief difference between an organic and an inorganic body?

7. What winds are usually accompanied by rain in this country? and what ones bring fine weather? Give reasons for your answer

8 State what you know about coral, pearls, ivory, sponge, coffee, petroleum, tapioca, chocolate

9 Why does a bucket of water appear lighter while it is still in the water than when out of it?

10 Distinguish between a *simple* and a *compound* body. Which of the following are simple and which compound; *Iron*, *sugar*, *tin*, *sulphur*, *water*, *gold*, *carbon*, *air?*

11. Explain why a candle will burn in a wide-mouthed jar, but not in a bottle with a narrow neck.

12. Distinguish between *vertebrate* and *invertebrate* animals. Name the different classes of the former with typical examples of each class.

13. Name the parts of a plant commonly called the "Organs of Vegetation," and describe the duties of each

14. Mention some of the uses of trees and plants. Which are most useful for food? for clothing? for building houses or ships? for furniture?

15. Give a short sketch of the life history of any one of the following: The butterfly, frog, grasshopper, bee.

16. State as fully as you can the effects of the use of alcohol upon the human system.

BRITISH AND CANADIAN HISTORY.

1. Name the Sovereigns of the House of Stuart, with the dates of their accession; mention one or more important events in the reign of each.

2. Tell what you know of the following personages: Simon de Montford, Perkin Warbeck, Titus Oates, Lord Clive, The Black Prince.

3 Briefly describe any one of the following: The Indian Mutiny; Trial of Warren Hastings; Gunpowder Plot; South Sea Bubble.

4 Mention the chief events in the reign of (1) William I ; (2) Henry III. ; (3) Henry VIII ; (4) George III.

5 Write a note on the settlement of Halifax.

6 Give dates for the following events: Establishment of Responsible Government in Nova Scotia; Massacre of LaChine; Founding of Quebec; Dominion of Canada formed; Capture of Beausejour; P. E. Island separated from Nova Scotia; D'Anville's Expedition; Battle of Lundy's Lane; Founding of Montreal; Incorporation of Halifax; Province of Manitoba organized.

7. State what you know regarding the history of Port Royal.

Shakesperian.

The study of the works of Shakespeare forms one of the interesting pursuits of Principal A. Cameron's pupils in English literature at the Yarmouth Seminary. Some years since Mr. Cameron communicated to *Shakesperiana*, a monthly magazine published in Philadelphia, the substance of a discussion conducted among the members of his class, chiefly young ladies, concerning the interpretation of a line in the "Merchant of Venice," which runs as follows:

> "And yet a maiden hath no tongue but thought."

On inquiring of the editor of *Shakesperiana* as to whether there were any generally accepted interpretation of the line, the views of several members of Mr. Cameron's class were presented. The first interpretation offered was that the speaker (Portia) felt herself restrained from declaring her affection through modesty and social conventionality. A second suggestion was that the meaning might be that "a maiden speaks just what she thinks — tells the plain unvarnished truth." The third interpretation suggested was that Portia thinks thoughts which she would like her lover to know, but is unable to clothe them in speech — as expressed by Tennyson:

> "Oh that my tongue could utter.
> The thoughts that arise in me."

These diverse views were illustrated with a considerable wealth of apt quotation from famous poets and writers.

Mr. Cameron was naturally and justifiably gratified to find that Dr. Horace Howard Furness, in his great work "The Variorum Shakespeare," in the noble volume devoted to a study of "Merchant of Venice," had fully reproduced the discussion of his Yarmouth Seminary class of 1885. Dr. Furness is known as the most distinguished living Shakespearian student and his edition of Shakespeare as a masterpiece of scholarship and criticism. Dr. Furness closes his observations on this line as follows: "In the interesting discussion in *Shakesperiana*, I should be inclined to think that the first interpretation offered is the true one."—*Yarmouth Paper*.

Manual Training.

At the risk of being accused of having an educational hobby, I will, for the third or fourth time, point out that our city boys are losing ground in the struggle of life on account of defective manual training.

Country boys have the advantage of a double training. In common with city boys they undergo the more or less artificial discipline of the school. But they also have that more natural training in which the hand and the head work together. Their inventive and executive powers are called into exercise in building fences, removing stones, constructing sheds and a hundred other things quite as mind-developing as parsing and the learning of historical dates. In their leisure hours they are studying natural history from the live specimens while scouring the meadows and woods in search of amusement.

What the country boy enjoys in the way of training hand and eye to be the true servants of the mind; what he enjoys in the way of opportunities and incentives for making the mind itself the real master of life through a well-round and harmonious development of all the powers, through the creation of the spirit of self-reliance, through the exercise given to the constructive and and executive faculty is almost infinitely greater than that which falls to the lot of the unhappy city boy of to-day. Out of school what has the latter to do with himself, his time, or the energy given him, as we are wont to say for some good purpose, though it would puzzle the most devout and the most ingenious to tell for what purpose energy should have been given to a boy condemned to live in a modern city."

In the system of education which you are now supporting, what do you accomplish beyond storing the mind with a mass of information—not always the most useful in the struggle for existence, while the powers of doing are left untrained. We omit almost wholly from our schoolroom curriculum — manual training — one of the most effective mind and body developers.

If you establish in some central locality one department devoted to manual work you will do much to improve our whole school system.

In the first place all boys over fourteen years of age who have come up to a certain standard in their other studies, could receive lessons at stated intervals, devoting to such work from two to four hours per week.

2. The teachers of the other schools might, as they do in other cities, take a course in manual training, and thus be fitted for conducting, to a suitable extent, hand work in their own departments.—*Report Supervisor McKay, 1890.*

School Attendance.

His audience must have been particularly glad that Mr. Blair, in his address here a few weeks ago, made the reference he did to the schools, intimating his intention of seeking some remedy for the existing evil. We have a good school law; a very large amount of money is annually expended upon it; property is pretty heavily taxed for the support of the schools, but this tax is cheerfully contributed; the expenditure is large enough to provide, as it does provide, to give every child in the country a common school education, and, notwithstanding these facts, the sad truth is that only about 60 per cent. of the children of school age in this Province are on the school registers, and only a little over half of those enrolled give average attendance at schools. We always presented the fact, just stated, as being one that demanded a reform, and have hailed with satisfaction every effort made by the education department and others to awaken public opinion to the enormity of thing. It is, let us be thankful, not a matter that can very well be made to do duty as a party hack. We sincerely hope the attorney-general will at once grapple the wrong and provide the relief, satisfied that all right thinking men and women, all who respect the necessity for primary education being freely provided for all the children of the state and who must as a consequence regard it as important that the children for whom this provision is made should, from choice or compulsion, take advantage of it, will approve of any measure, having the desired result in view, that the government may propose.—*Carleton Sentinel, Jan. 31st.*

Window-pane Pictures.

From eve till dawn, the long night through,
Cold winter's elfin band
Such pictures drew
As never grew
Beneath the touch of human hand.
In dawn's dim light they faintly gleamed
On frozen panes, and glimpses seemed
To give of fairy-land.

The boughs of great old trees were bent
With silver sheen; and forth was sent
A frosty light from distant height,
Where glitt'ring spires appeared to sight,
And far-off castle wall.

Now here at hand, like a silver strand,
Hanging in mid-air fairily,
A drawbridge spanned the chasm grand,
Gleaming before us airily.

A stream flowed down the mountain's side,
And cast a silvery spray,
Then dashing on with leap and slide,
With graceful bound and easy glide
It reached the boulders gray,
And in deep gorges swept away.

Now o'er the cold, gray landscape came
A wavering light, a pale rose tinge
That touched the leaves and mosses' fringe,
Then slowly grew to ruby flame
Setting the distant peak aglow,
Melting from frozen heights their snow.

So fairy-land now fades away,
And we may watch in vain.
Our frostmade pictures melt from sight—
The drops roll down the pane.

—*Mabel Nichols, in February St. Nicholas.*

The Swiss universities are broad and liberal in the highest degree. Statutes are passed in their senates with simple reference to elevation of character and with no apparent thought of the sexes as separate. These statutes, when presented in council, are treated in the same spirit, and the question as to the advisability of co-education came first in every university after women who had already entered and studied. The original statutes excluded no one, and consequently when — after a remarkbly long time — women applied for admission, their names were taken exactly as those of their brothers were taken; they took their places among these and worked there undisturbed until some other consideration brought the question forward. — Flora Bridges, *in Popular Science Monthly for February.*

School and College.

At a lecture on electricity before a large audience in Orpheus Hall, Halifax, by the Science Master of the County Academy, two students, Masters Douglas Mackintosh, and Stanley DeWitt, assistants, conducted the larger number of experiments without a single failure. Much of the apparatus was made by the academy boys, including a special form of galvanoscope, electro-magnetic devices, an electric motor by Master Burton and an induction coil by Master Eagar.

Says Supervisor McKay in his report: Sister Bernard, who had charge of St. Patrick's Girls' High School, Halifax, since it was first organized, has retired from the principalship on account of ill-health. The school owes to her wise management its present high standing. Sister DeChantal, who succeeds, will prove equally successful.

The free scholarships offered for competition by the Victoria School of Art and Design, Halifax, were this year won by Miss H. Moody, Miss P. Belcher and Miss G. Fairbanks of the academy, and Miss L. Mahoney and Miss K. Mahoney of St. Patrick's Girl High School.

The attendance at the Truro Academy numbers one hundred and forty, of whom one-fourth are from beyond the town.

Principal Campbell, Truro Academy: "A good example is worth hours of lecturing. Punctuality in a teacher is almost sure to create punctuality in the pupils. Honest, diligent work, with a kindly interest in the pupils' success is sure to be rewarded in the end. A time for everything and everything at the proper time is a motto that should always be followed. Some teachers assign work which is not taken up for days, and perhaps not at all; or they prepare a time table for the pupils, and then entirely disregard it themselves. Others assign work for the pupils to prepare, and then come to class unprepared themselves. They require their pupils to do without the aid of a book what they themselves can only do with the book. Such teachers wonder why they don't succeed, while the wonder is how they could succeed."

The students of the New Brunswick University recently held a most delightful conversazione. The attendance was large and the rooms at the college building were crowded with a gay and brilliant throng.

J.W. Barss, Esq., Wolfville, has donated $10,000 to Acadia College to aid in founding a professorship in the arts course of the college. The new professorship has been established. By special vote it has been associated with the chair now occupied by Prof. R. V. Jones, Ph. D., and will henceforth be known as "The J. W. Barss Professorship of Classics." By his last gift Mr. Barss, a former treasurer and a liberal donor, will take foremost rank among the many generous benefactors of the college.

Mt. Allison University, Sackville, is to have a course of seven law lectures delivered during the present term, the purpose of these being to make students acquainted with the ordinary legal forms and procedure of business life. This is another evidence that Mt. Allison is determined to meet the educational requirements of the times.

The St. John *Globe* has the following concerning the Girls' High School:

> In the the *Educational Record* of Quebec for the month of November is a statement in considerable detail of the results of the University School Examinations — practically the McGill entrance examinations — based upon the report of the Board of Examiners for 1890. The fact is noted that thirty-four schools sent up two hundred and five candidates, besides twenty-eight who entered for special examination. Of this number one hundred and nineteen obtained the A. A. certificate, eleven the junior certificate and the rest failed. None of the schools which sent up candidates has any better results than the Girls' High School of St. John, from which there were eleven candidates, ten of whom successfully passed the A. A. examination, and one obtained the junior certificate. None failed. The Montreal High School for boys had 28 who passed, one obtained the junior certificate and two failed; from the Girls' High School of the same city twelve obtained the A. A. and two failed. These are the only two schools out of the entire thirty-four whose results approach in point of numbers our St. John school. In looking over the special reports of the examiners a great deal is found of special interest to the St. John school. For example, in regard to the dictation papers, while these are generally commended, the fact is mentioned that "some of the country schools send up careless, slipshod papers," but for "neatness the candidates from the Girls' High School, St. John, and from the Cookshire Model School deserve special mention." In Classics, "the Boys' and the Girls' High School of Montreal, as also those of Quebec and the Girls' High School of St. John, deserve favorable mention for good work done." "In," says the report, "a subject like Geometry, which deals with formal reasoning, it might be supposed that the attention of the pupils would be devoted to the necessity of precise and accurate statements and neatness of work. In some of the schools this has been done; and in this connection the Girls' High School of St. John, the Cookshire Model School, and the Coaticook Academy deserve 'honorable mention."' Again, on the English Literature subjects the report says that for "honorable mention" the examiners would point out the Montreal High Schools and the Girls' High School of St. John, the papers from which were neat and well expressed; in fact, a pleasure to read. As a matter of fact, in almost every case in the report in which special mention is made of a school the St. John school is included. This is a statement of facts that must be satisfactory to the teachers, to the pupils, to the parents, and it certainly ought to be gratifying to the taxpayers.

PERSONAL.

Wm. R. Fraser, Esq., B. A., (Dal.), late classical master in the Pictou Academy, has been awarded a University scholarship in Greek at the Johns Hopkins University.

Inspector Carter has finished his examination in the western part of Charlotte county.

BOOK REVIEWS.

Insecta. Guides for science teaching, No. VIII, Boston Society of Natural History, by Alpheus Hyatt and J. M. Arms; cloth, 4½ in. × 6 in., pp. XXIII + 300, $1.00. (Boston, U. S. A , D. C. Heath & Co., 1891). The typographical character of this book is superior. For its price we have no hesitation in saying that it is the best book on entomology for the beginner which we have yet seen—and the best for the teacher who thinks he knows something of the science as well.

Federal Government, Introduction to the study of. Harvard Historical Monographs, No. 2, by Albert Bushnell Hartt, Ph. D., assistant professor of history. Paper, 9 × 6 in , pp. X + 200. (Boston, U. S. A., Ginn & Co., 1891). An admirable volume. We give the titles of its chapters, which in turn are most systematically sectioned and paragraphed. I. The Theory of Federal Government. II. Ancient Confederations. III. Mediæval Leagues and National Confederations. IV. The Four Great Existing Confederations (U. S. A.: Switzerland, Germany and Canada). V. Latin American Federations. Appendix a, Conspectus of the Federal Constitutions of Canada, Germany, Switzerland and the U. S. A. b, Key to the Conspectus. c, Bibliography of Federal Government.

Good Night Poetry [Bedside Poetry]. A parent's assistant in moral discipline. Compiled by Wendell P. Garrison. Cloth, 4½ × 7 in ; pp 143; 70 cents. Boston, U. S. A., Ginn & Co., 1891. Both printer and compiler did their work well.

Poverty Superseded. A new political economy, a paper on Economic Science, read before the Nova Scotia Institute of Science, Jan. 19, 1891, by A. P. Reid, M. D., etc., Supt. of the Nova Scotia Hospital for Insane. Pamphlet, 16 pp. Government to collect percentage of all earnings to form a relief and superannuation fund, to control and manage manufacture and trade generally; to nationalize savings banks, life assurance, an annuity system; to lessen the present credit system, abolish the law for collecting debts and make economy compulsory.

La Canne de Jonc (Malacca Cane), by Alfred de Vigny, with notes and grammatical appendices by V. J. T. Spiers, M. A. Boston, D. C. Heath & Co., publishers. The story is of Paris before and during the revolution of 1830. The story is quiet and entertaining, and the style lucid and agreeable.

BOOKS RECEIVED.

Reproduction of Geographical Forms, Redway; D. C., Heath & Co., publishers, Boston.

From Colony to Commonwealth, Moore; Plato's Georgias; Ginn & Co., publishers, Boston.

EXCHANGES.

We welcome the New Glasgow *High School Monthly*.... The *Temperance Index* starts out with renewed vigor under its new editor, Firman McClure....The Halifax *Chronicle* advocates the introduction of the Metric system, and it is one of the leading Atlantic Canadian dailies ....The *Colonial Standard* has a good correspondent who presses the same reform....The *American Naturalist* for December has two articles on conchological subjects, one on the Termites, one on Annelid descent with Kingsley's "Record of American Zoology" continued. The notes under the several departments are new and numerous.

Current Periodicals.

The *Century* for February contains an article by Geo. R. Parkin, A. M., formerly of the Fredericton Collegiate School, on "The Anglo-Saxon in the Southern Hemisphere." It is written in Mr. Parkin's vein, from personal observation of life in Australia, and will find a wide and sympathetic circle of readers in these provinces....The *Popular Science Monthly* for February has several interesting educational articles—"Precision in Physical Training," "Progress in Agricultural Science," "Co-education in the Swiss Universities," "Religious Teaching in the Public Schools."....*Wide Awake* for February has a number of unusually clever short stories. "Sir Grimbald's Ransom" is a ballad of the brave crusading ancestor of Sir Julian Pauncefort, present British Minister to Washington, whose brave lady gave her right hand to ransom her lord from the Saracens *St. Nicholas* for February has among other interesting sketches and stories a timely one on "How the Mails are Carried."....*New England Magazine* (Boston) for February is filled with interesting articles and beautiful illustrations; the "History of Historical Writing in America, No. II," is of great value to the student, and all will read with pleasure the illustrated article, "The Old Masters of Boston.". *The Kindergarten* (Chicago) for Teachers and parents is conducted with rare ability. We can safely say that no home or primary school should be without it....The numbers of *The Living Age* for January 31st and and February 7th contain "Shakespeare's Ghosts, Witches and Fairies," "Birds," "Shut up in the African Forest," "The Origin of the Great Lakes of North America," and other articles. For fifty-two numbers of sixty-four large pages each (or more than 3,300 pages a year) the subscription price ($8) is low; while for $10.50 the publishers offer to send any one of the American $4.00 monthlies or weeklies with *The Living Age* for a year, both postpaid. Littell & Co., Boston, are the publishers....*Garden and Forest* (New York) contains each week admirably illustrated articles on new or little known plants... *Vick's Floral* Guide (Rochester, N. Y.), is again to hand and is, this year, more interesting and valuable than ever to the gardener.

Pamphlets and Catalogues Received.

Calendar of Prince of Wales College and Normal School, Charlottetown, P. E. I., for 1890-91; Alex. Anderson, LL. D., Principal; containing examination questions and other useful information....The *Cornell University Register* for 1890-91; containing list of students (1,347) at present attending the University, Ithaca, N. Y., with courses of instruction, etc....*Harvard University Catalogue*, 1890-91; with list of students in attendance this year (1,339), courses of study, etc....*U. S. Board of Geographical Names*; Bulletin No. 1.; issued Dec. 31, 1890; published by the Smithsonian Institute, Washington: a valuable brochure on the correct spelling and pronunciation of geographical names....*Educational Addresses*, McMaster University, Toronto, delivered at the opening of the various departments, Oct. 1890....*Bulletin of the Natural History Society of New Brunswick*; published for the Society by Barnes & Co., St. John; contains a portrait and sketch of the life of Prof. Ch. Fred. Hartt, by G. F. Matthew, A. M., President of the Society; Zoological Notes, by W. F. Ganong, A. M., and other useful information ...*Papers on the School Issues of the Day*, Nos. IX, X and XI; read at the National Educational Association, St. Paul, July, 1890; published by C. W. Bardeen, Syracuse, Y. N ...*School Room Classics*, No. VIII: Tiedman's Record of Infant Life, by Louis Soldan, Ph.D.; published by C.W. Bardeen, Syracuse, N. Y.

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THE HEADMASTERSHIP of the Boys' High School will be vacant at the close of the present session.

Applications for the position will be received by the undersigned up to 1st April next.

E. W. ARTHY,
Secretary.

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The Calendar for the Session of 1890-91 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:—

Faculty of Arts—(Opening Sept. 15th. 1890).
Donalda Special Course for Women—(Sept. 15th).
Faculty of Applied Science—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
Faculty of Medicine—(Oct. 1st).
Faculty of Comparative Medicine and Veterinary Science—(Oct 1st).
Faculty of Law—(Oct. 1st)
McGill Normal School—(Sept 1st).

Copies of the Calendar and of the Examination Papers may be obtained on application to the undersigned

(Address McGill College.)

J. W. BRAKENRIDGE, B.C.L., Act'g Secretary.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

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The Educational Review *is published about the 10th of each month Any subscriber failing to receive it by the 20th should notify us of the fact. Subscribers wishing a change of address should give the* **Former** *as well as the* **New** *address.*

In future all correspondence and business communications (including payment of subscriptions) from Nova Scotia and Newfoundland should be addressed to Editor EDUCATIONAL REVIEW, Halifax, N. S. All other communications, including subscriptions, should be addressed Editor EDUCATIONAL REVIEW, St. John, N B.

EDITORIAL NOTES.

WE intend to devote a large portion of our April number to suggestions for Arbor Day, and notes on plant study. It will be issued not later than April 10th.

THE appeal made to the teachers of Cumberland and Colchester by Inspector Lay will, we hope, meet with a ready response, not only in those counties but in others throughout Nova Scotia and New Brunswick. The fact that the disaster at Springhill, the most terrible that has afflicted these Provinces, has made one hundred and fifty children orphans, will meet with a ready and sympathetic response from other children more happily situated, if their attention is directed to the matter and their co-operation secured.

THE twentieth annual report of the Halifax School for the Blind has been received. This school, which has so many claims upon the people of the Atlantic Provinces, is yearly increasing its influence, in the zeal and devotion of its teachers, and in the number, industry and application of its students. During the past year additions have been made to the buildings by erecting a wing as a residence for the boys, and another is proposed for the girls. The principal of the institution, Mr. C. F. Fraser, is indefatigable in his efforts to increase the usefulness of the institution, and he should receive the assistance and support of every well-wisher of that most interesting class of young people in whose interest the institute is conducted.

WE publish the following notice from Mr. H. J. Hill, secretary of local executive committee to make arrangements for the International Educational Association in Toronto, in July next:

> The annual Convention of the National Educational Association of the United States, for the present year, will be held at Toronto, from the 14th to the 17th of July next, and a local committee has been appointed to make all the necessary arrangements. At least twelve thousand teachers of public schools, collegiate institutes, high schools, universities and school Inspectors, throughout the United States and Canada are expected to attend the convention, and a large amount of work has to be done preliminary to the meeting to make arrangements for accommodation of this large number of visitors. Cheap railway rates have been secured from all parts of Canada and the United States. An official bulletin will be issued about the middle of March, giving a full programme of the proceedings at the convention, officers of the association, railway arrangements, etc, and will be forwarded to any one desiring a copy on their dropping a postal card to the secretary of the local committee, Mr. H. J. Hill, at Toronto, or Mr. J. L. Hughes, chairman of the executive committee, Toronto. The most complete arrangements will be made to give the visiting teachers a splendid welcome, and to make the meeting a great success. Local excursions are being arranged to all important points of interest surrounding the place of meeting. The meeting will be of an international character, and as it is the first time the association has ever met in Canada, it is hoped that the Canadian teachers will attend in large numbers to take part in the proceedings.

IT is with much regret we have to record the death of Principal J. Scott Hutton, A. M., of the deaf and dumb institution at Halifax. No better monument to his genius can exist than the remarkable development of this institution during the thirty-three years since he took charge of it at its start. Principal Hutton was born in Perth, Scotland. When quite young he entered the University for deaf mutes at Edinburgh. In 1857 he received the appointment at Halifax and remained in charge until his death, 25th February, except for three years, after 1878, when he went to Belfast in a similar capacity. In his department Mr. Hutton stood high in the estimation of educationists throughout the world. He was a man of sterling qualities in every relation as a citizen. His illness lasted for about two months.

The teachers and pupils of the Victoria and Girls' High School, St. John, have contributed $70 to the relief of the sufferers by the Springhill disaster.

Professor Archibald MacMechan, Ph. D., of Dalhousie College, in an able paper before the Nova Scotia Historical Society, December, completely exploded the universally current fiction that John Crowne, dramatist, (who lived in the latter half of the seventeenth century, and was spoken of as a rival of Dryden) was a Nova Scotian, and the son of an "independent" minister. He was the son of a Colonel Crowne who, with Temple and others, played leading parts in the history of Acadie during the middle of the said century. John Crowne when a lad was for a short time at Harvard and boarded in a minister's family; but there is no probability of his ever being on Nova Scotia soil.

Dr. Patterson read a paper before the same society in two sections, one at the January meeting and the other at the February meeting on the early Portuguese voyages of discovery to North America. Very many new points were brought to light and many new views suggested by the paper.

The principalship of the Protestant Academy in St. John's, Newfoundland, is vacant.

In a letter to the Halifax *Herald*, dated Berlin, January 29th, Prof. Frank H. Eaton has the following in reference to high school and college work:

* * * "The greater part of the work covered in the Freshman year of each of our colleges is work that every respectable high school in America undertakes, and is qualified to do. When, in addition to this, the fact is remembered that, at no point in any of our college courses is an undergraduate qualified, without extra work, to meet the requirements of an academic license examination, the waste of teaching power will be quite apparent. In addition to the economical gain which would follow upon the co-operation of the colleges, and the educational department, there are other advantages, direct and indirect: (1) The scholarship standards, on which academic licenses are based, would be materially improved; (2) The organization of the work of the academies would be simpler, more consistent and more efficient; (3) The college faculties, relieved of high school work which they are now doing, could widen the range of optional courses, and intensify the specialization of departmental teaching; (4) Students entering college under the application of higher admission standards would attain in a THREE years college residence, at least, as high a degree of scholarship as now they are able to reach in a FOUR years' course; (5) A community of interest between the college faculties and the administrators of public education, such as does not now seem to exist, would be created "

The death of Jeremiah Meagher, Principal of St. Dunstan's school, Fredericton, after only a week's illness, removes a well known and successful teacher.

"He has been teaching continuously, says the Fredericton *Gleaner*, since sixteen years of age, with a break of five or six years when he carried on a grocery and dry goods business on Queen street in this city. He has been longer in the teaching profession than any other teacher in this city, and probably longer than any in New Brunswick. He commenced his teaching in Fredericton and taught in various parts of the Province, including St. John and Charlotte counties. For fourteen years he has been the Principal of St. Dunstan's, and his connection with that school has been a marked success. He was 58 years of age.

In February Professor MacMechan gave a very interesting lecture on "The influence of young men" before the Halifax Y. M. C. A. in Orpheus Hall. The young man was he whose life and death inspired Tennyson with the thoughts crystallized in his "In Memoriam" — the gospel of the nineteenth century.

In the course of a lecture recently delivered before the Massachusetts Horticultural Society on the "Geographical Distribution of Plants," by W. F. Ganong, A. M., instructor in botany at Harvard University, he said:

"Man's influence upon the plant kingdom has been far less than it appears at first sight, and it is nearly uniformly unfavorable. The carrying of plants from place to place includes, for the most part, forms cultivated for food or for ornament, and the majority of them, if left to themselves in their new homes, would soon be exterminated, and hence produce no lasting effect upon plant distribution In fact the cases in which man has produced any considerable effect upon the vegetation or flora of a region are extremely few, and the effect is nearly always destructive. The stumps where once a forest stood speak most forcibly of man's power to destroy.

PHYSICAL GEOGRAPHY.

We hope our readers have carefully studied the excellent paper that appeared in the February Review, by Mr. Manning, on Physical Geography. The writer claims a more excellent way of studying geography than by the methods that are unfortunately too prevalent in our schools; and the clearness and force with which he has presented his views should set every teacher thinking whether his methods of teaching this subject are in accordance with nature and reason; whether they inspire a love in the minds of children for this most fascinating of school studies or create an aversion for it; whether they unfold nature's truths or deal in details fit only for gazeteers or encyclopedias.

We submit this proposition to every intelligent teacher who has calmly studied the matter of how to teach geography: Is not this the subject, above all others, for cultivating the powers of observation in children? And how can this be done better than by referring constantly to the natural scenery in the neighborhood of the school, and by the daily observation of natural phenomena? Every warm day with its attendant evaporation of moisture, every rain storm, or snow storm, the varied forms of frost, either on the stream, the ground, the window pane, the branches of trees in a "silver thaw," the coming out of the frost on a stone or brick building, the sharp reports made by "Jack Frost" on a cold winter night—the varied forms of moisture, as dew, fog, mist, clouds, hail, rain, sleet—all furnish material most valuable as illustrative lessons in geography. We have seen pupils absorbed hour after hour in trying to determine why the surface only of rivers and lakes freezes; why there is an abundant dew on a still, clear night and little or none on a windy or cloudy night; why some forms of moisture have a definite shape and others have not. These and other questions stimulate inquiry; they teach pupils to observe and reason, and they open the doors to other sciences of which physical geography may be regarded as the parent,—to physics, chemistry, geology and botany.

Again, the natural scenery in which every district of these provinces abounds affords ample opportunity to study nearly every physical feature which the earth presents—hill, plane, slope, basin, river, island, etc., so that from the small world of the pupil, if accurately studied and understood, he may be led to reason and generalize about the larger world that he may never see, but still may have a far more correct conception of than he who travels over large portions of it with his eyes shut. The child may be led to see also in his own neighborhood the operation of those forces, which have helped to mould our earth into its present shape—the action of air, frost, running water—and to see in the manifold changes of the landscape around him the operations of laws which are eternal,—laws which have for ages been gradually shaping the scenery of our earth and giving it here and there those touches of rare beauty which meet our eyes everywhere,—laws which have made life possible on this earth and which continue to govern our existence.

The physical geography that does not lead the student to see beauty and harmony in nature is scarcely worthy the name. The many colored hues of a golden sunset, the varying tints of the distant hills, the ever changing forms of the clouds, the hush that comes at eventide over forest, or river, or lake, appeal to the imagination and sense of beauty. And if one has been lead aright in the study of nature he will see design everywhere. There will gradually be unfolded to him the unity and grandeur of this Design; and he will catch a glimpse of some of the wonders of this world and of Him who created it. If these are some of the results that come from the study of physical geography, should it not be pursued with a spirit of earnestness?

THE BOTANICAL EXPLORATION OF NOVA SCOTIA.

A valuable and interesting address on the general botany of the Province was given by Professor Lawson, of the University, to a large audience of botanists at the last regular monthly meeting of the Institute of Science of Nova Scotia in Halifax. He called attention to the cosmic problems which may be solved by an accurate knowledge of the distribution of plants. He divided the land surface into the below mentioned *seven* areas; and the coast line, for the study of the marine algæ, into *eleven* sections. He suggests that the botanists of the Province should immediately proceed to make a full and accurate examination of these with a view to publishing complete lists for each area or section. From such data, when obtained, very important conclusions would likely be derived.

We are glad Professor Lawson has undertaken the task of directing the energies of our botanists into definite lines, which promise valuable results. As a botanist he has few peers. As a student he first made a practical acquaintance with European floras. While Professor in Queens University he gave a great impetus to the study of botany in Ontario; and so thorough has his researches in some departments been, that during the lapse of over twenty years very little more could be added to his investigations, as can be seen by reference to his papers in the Canadian

Naturalist and *Geologist* and other publications. He has now been many years in Dalhousie University, and adds to his practical knowledge of the flora of other countries that of our own. No better qualifications for a leader can possibly be found than are united in the person of the genial past president of the Royal Society of Canada. There is now very definite work outlined for the botanists of our Summer School of Science and all others, and especially for local botanists. We shall be glad to report rare finds in the meantime.

We give here the *areas* and *sections* as mentioned; so that with the opening spring our amateur botanists may commence a thorough survey of their respective localities with the view of publishing ultimately lists of the *flora* of each.

AREAS FOR OBSERVATION OF OCCURRENCE OF LAND PLANTS.

AREA.
1. Inverness and Victoria Counties.
2. Cape Breton and Richmond Counties.
3. Antigonish and Pictou Counties
4. Hants, Colchester and Cumberland Counties.
5. Guysborough and Halifax Counties.
6. Yarmouth, Digby, Annapolis and Kings Counties.
7. Lunenburg, Queens and Shelburne Counties.

In recording the occurrence of plants in the several areas, the nature of the *habitat*, or particular place of growth, should be described briefly, as: Sea shore; woods; swamp; lake; stream; rocky places; water falls; hayfields; cultivated field; garden; roadside, etc. The elevation above sea level may be given approximately, as: Between 100 and 200 feet; between 200 and 300 feet, etc. Where mosses, lichens and fungi are found on trees, the species of tree should be stated, if possible. The same with plants growing on bare rocky surfaces (the kind of rock.)

COAST SECTIONS FOR OBSERVATION OF OCCURRENCE OF MARINE ALGÆ

Gulf of St. Lawrence Shore and Northumberland Strait.

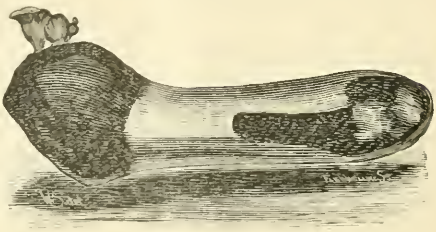
SECTION.
1. From Cape North to Margaree harbor.
2. From Margaree harbor to Strait of Canso.
3. From Strait of Canso to Pictou harbor.
4. From Pictou harbor to Bay Verte.

Atlantic Coast and Bay of Fundy

5. From Cape North to St. Ann's Bay.
6. From St. Ann's Bay to Louisburg.
7. From Louisburg to Strait of Canso.
8. From Strait of Canso to Halifax harbor.
9. From Halifax Harbor to Barrington Bay.
10. From Barrington Bay to Annapolis Basin.
11. From Annapolis Basin to head of Chignecto Bay.

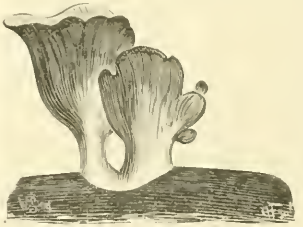
It is important to notice in recording habitats of sea weeds, whether they are found growing on the beach, in pools or otherwise between tide marks, or have been cast up from deep water.

The Whale's Bone That Budded.



FUNGOID GROWTH FROM DRY WHALE BONE.

Fungous plants sometimes choose odd places for a habitat. A certain species is sometimes found on the horns or hoofs of cattle, while another species has been found in the brains of birds. We question, however, whether a more singular habitat has ever been chosen by a fungus than among the "dry bones" of a museum. But during this winter a whale bone in the museum of Acadia College, Wolfville, "budded." The cut at the head of this article represents the plant and its curious "host." We give an enlarged drawing of the plant which appears to be one of the *Agaricini* fungi.



We append below the letter of Prof. Coldwell, the Curator of Acadia College Museum:

ACADIA COLLEGE,
Feb. 27, 1891.

Mr. Editor:

I send for your paper two drawing of a plant that grew this winter in our museum from a whale bone picked up two years ago on the Yarmouth beach. The bone has been in the museum a year and a half and is in a dark, cool place. The plant has no chlorophyl, is hard throughout, white at the stem and on the top and grey underneath. It would seem to be an arctic species from its growing in mid-winter. Can you account for its unusual behaviour?

Yours, A. E. COLDWELL.

A memorial brass, with the following inscription, has been placed in the galilee of Uppingham Chapel. Round the brass is a border of Provencal roses, Mr. Thring's favorite flower.

In grateful remembrance of
EDWARD THRING,
Whose writings animated the art,
And whose life enriched the work of teaching,
A few English and American teachers erected this tablet.
"Honor the work, the work will honor you."—E. THRING.

On the Early History of New Brunswick.

BY MOSES H. PERLEY.

A portion of a lecture delivered before the Mechanics' Institute, St. John, in 1841; now for the first time published.

(Continued from Feb. number.)

[Our readers will of course have noticed the abbreviations and other irregularities of Mr. Perley's manuscript. It must be remembered that the lecture was not intended for the press, but was really a running guide to the lecturer, and does not at all represent its author's style either of writing or speech; in both of which Mr. Perley was both polished and powerful. The present editor in reproducing the manuscript simply follows the only good rule in such cases, and reproduces it *verbatim et literatim.* *W. F. G.*]

The only cleared spots about the harbour at that time, were at and near Fort Frederick, as you perceive by the map, and the ruins of the French Fort at Portland Point. All the rest of the Harbour, & particularly where the city now stands, wore a most dreary and forbidding aspect. The party found great difficulty in penetrating into the woods in this vicinity, all the trees having been blown down, by a tremendous hurricane which swept over the country, west of the St. John, in 1758.

The general opinion of the party was against taking lands bordering on, or near this Harbour, but in this opinion, Mr. Simonds and Mr. White did not concur. The party next proceeded up the river St. John, noticing as they passed, the devastated settlements of the French, and the blackened fragments of their buildings, which had been mercilessly burned. They particularly examined the remains of the celebrated old Fort of Gimisik which I have so often had occasion to mention.

(I am enabled to state, on good authority that this famous Fort, where so much fighting was done and bravery displayed, stood at the lower entrance of the Jemseg, near the residence of Charles Harrison, Esq., and on property now owned by him. Old swords, copper kettles, hatchets, and a variety of ancient articles, have been frequently ploughed up, and relics are found there to the present day.

The stumps of apple trees, planted by the French, are yet remaining, and it is well known that those trees bore fruit long after the first settlers took up their residence on the St. John.

At the close of the last lecture, Hon'ble Hugh Johnston, whose property is immediately opposite the site of the old fort, stated to me that his men ploughed up a canon-ball of considerable size in his meadow last summer.)

The party pursued their course up the river from Jemseg, and on the Hill where Burton Court House now stands, they found a french settler, the last and only one who remained. On reaching St. Ann's Point (where Fredericton now stands) they found the margin of the River, along the whole of what is now the Town plat of Fredericton, cleared for about 10 rods back from the bank, and they saw the ruins of a very considerable settlement. The houses had been burned, and the cultivated land was fast relapsing into a wilderness state. At the mouth of the Nashwaak the remains of a fortress were visible. The solitary Frenchman whom they met, told them that this Fortress, was reported to have been built by a party of settlers from Scotland, long prior to the settlement of the French at St. Ann's. This statement is very likely correct, as the Earl of Stirling sent settlers to this country from Scotland, under Claude de la Tour, who probably built this Fort at Nashwaak[*] at the time he built the noted Fort of Jemseg, which is fully and clearly established he did under the authority of the Earl of Stirling.

On the arrival of the party at St. Ann's they encamped and commenced a survey. While so engaged, a large party of Indian Chiefs appeared, in their war dresses, with their faces painted in a variety of colors. They were attended by about 500 warriors, and with great solemnity informed the party that they were intruders upon their rights. They said that the country belonged to them and that unless the party desisted from further operations and withdrew, they would be made to do so.

The party promised to comply with the wishes of the Indians, at the same time informing that they had full authority to survey lands on the river. The Chiefs in reply alleged that by a treaty made between them and Governor Lawrence of Nova Scotia, it was stipulated that no English settlement should be made above Grimross.

The party then fell down the river about twelve miles, and then made the survey of a township which they named Maugerville.[†]

The next year, 1763, a party of settlers arrived from Massachusetts in four vessels. There were about 200 families, in all about 800 souls, under the charge of Israel Perley. They forthwith proceeded to the new Township of Maugerville, where they established themselves, and thus made the first permanent British settlement on the river St. John. [‡]

[*Here follow several paragraphs on the history of the North Shore, but as their substance is already in*

---

[*] It is now known that this fort was built by the French in 1692. It was called by them *Fort St. Joseph.* *W. F. G.*

[†] How irrelevant a circumstance often changes history. Had the settlers been allowed to make their survey, they would doubtless have settled there, and the site of Fredericton must have been later fixed elsewhere. *W. F. G.*

[‡] The facts in the last three paragraphs are of very great value as fixing the exact dates of the advent of the New Englanders to New Brunswick; the dates are wrongly given in some printed works.

Among some papers loaned the present editor by Miss Perley, of Fredericton, great granddaughter of Israel Perley, occurs one tattered old fragments of a Ms., evidently part of a much longer document, which has some additional facts of value. It is undated, but very old, and certainly written by one of the early settlers. The part torn away I have provisionally supplied in italics, and the words in small capitals *print, (in Cooney's History of New Brunswick and Gaspé), they can be omitted here.*]

The settlers on the St. John, at Maugerville, in addition to the many difficulties and privations attendant on establishing new settlements in a remote part of a wilderness country, were for some time also annoyed by threatened attacks from the Indians. But in 1765 an amicable arrangement was entered into, and a good feeling established between them and the white settlers. From that moment the decline of the Indians may be dated, and the swelling tide of civilization, as it rolls its restless course over this favored land, bids fair in a few years to sweep off the last trace of the Red man, leaving only his remembrance in the land which once belonged to him, and which for unnumbered ages he had roamed over in perfect freedom and independence, and in the enjoyment of sovereign power.

On the 30th April, 1765, all the country bordering on the St. John, was erected into a county, called the county of Sunbury in the Province of Nova Scotia.

This year, 1765, was an important one to this Province. Mr. DesBarres surveyed the whole of the Bay of Fundy for the first time, and an order passed the Council of Nova Scotia directing the Honble. Charles Morris to survey the lands upon the St. John River, and between that river & the southern boundary of the Province. (St. Andrews laid out soon after this.)

On the 29th May, 1765, a writ was issued to the Inhabitants of the St. John River, in the county of Sunbury, directing them to choose a fit person to represent them in General Assembly. The Honble. Charles Morris was the first representative chosen; he served for several years, and then the late James Simonds, Esq. was elected, and he served until Sunbury was erected into a separate Province.

In consequence of the friendly relations established with the Indians, Mr. White in this year built a trading-house at St. Ann's Point, where for many years he traded with the Indians for furs, and supplied them with necessaries. The settlements on the River continued to increase slowly for some years, and a few more persons began to settle about this harbor. Messrs. Jonathan and Daniel Leavitt settled in Carleton about this time; they owned and sailed a small schooner, which they employed in trading and fishing, and that small schooner was then the only vessel owned in this harbor and the solitary keel, which cleft its waters. Think of that, ye merchants, who now send mighty ships to sea, in scores, and remember the time when the navigation of this port of St. John consisted of one small schooner!

(The Messrs. Leavitt became very tired of being the only navigators, and the loneliness of the place became wearisome to them — they said to Mr. White, that they should remove to some other place, where there was a greater population and more to be done. But Mr. White encouraged them to stay, concluding his observations with: "Don't be discouraged, boys, keep up a good heart! Why, ships from England will come here yet!")

In 1768 all the troops at Annapolis, Cumberland, Amherst and this place were removed to Boston, in consequence of some threatened disturbances there.

(To be continued.)

THE annual report of the governors and principal of McGill University, Montreal, for 1890 has been received. The statement of the progress that is being made under the impetus of generous donations, and the increased stimulus to higher education, especially in the direction of applied science, is most encouraging to note. The number of students attending classes at McGill during the past year was 854. Out of 324 students in the arts course, 108 are women.

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are marked through with a pen in the original. It is hended "State of Facts."

In the year 1761 a number of DISBANDED Provincial
officers and soldiers in New England
who had servd. in several Campains
During the then french war
agreed to form a settlement on St. John
River in Nova Scotia, for which Purpose
they sent one of their number to Halifax who obtained
an order of Survey for Laying out a
Township in mile squares in any Part
of St. John's River (the whole being then
a Desolate wilderness)
This Township called magerville was laid out in the year 1761
[or 1762?]
and a number of settlers enert into it
; Encouraged by the King's Proclamation
for settling the land in Nova Scotia
in which among other things was this clause
that People emigrating from the
New England Provinces to Nova Scotia
should enjoy the same Religious Priviledges
as in New England—
and in the above mentioned order of
Survey was the following words—viz.
"you shall Reserve four Lots in the Township
"for Publick use, one as a Glebe for the
"Church of England, one for the Dissenting
"Protestant; one for the maintenance
"of a School, and for the first
"settled minister in Place.
These orders were strictly complyd. with
IN THE YEAR 1763 but finding Difficulty
in obtaining a Grant of this Township
from the government of Nova Scotia
on account of an order from home
that those Lands should be Reservd.
for Disbanded forces, the settlers Did In
the year 1763 Draw up and forwarded a
Petition to the Lords of Trade and Plantations
setting forth the s*ervices they had* Done
for government in *the last war*
The encourage*ment they received*
for Removing to *Nova Scotia at a*
great expense, the*ir efforts for*
bringing forwd. a *survey of the land*
and Praying for a g*rant of land*
which they had settled.

Here it ends abruptly. The present editor has had called to his notice by his friend, Dr B Rand, that the fact of these colonists being disbanded soldiers is important, and serves to differentiate this colony from others founded in Nova Scotia about the same time.

A writer in the *Magazine of American History* for February, 1891, says these colonists came from Byfield, Ipswich, Rowley Boxford and Marblehead, and that Israel Perley was from Boxford. *W. F. G.*

Astronomical Notes.

The Sky in March and April.

Six months ago these Notes contained a description of the heavens as seen in this latitude at the hour XXI. sidereal time, which was nearly 9 p. m. mean time on September 20th. Three months later XXI. fell at 3 p. m.; and at 9 p. m. the celestial sphere had turned through a quarter revolution, and the sidereal hour was III. A description of the heavens at this hour was given in the Review for December. On March 20th the hour XXI. will fall at 9 a. m., and at that hour — if the sun were got out of the way, and if the sky was clear — we would see the same stars and constellations that we saw at 9 p. m. on September 20th, and we would see them in the same position they were then in. Six hours later, at 3 p. m. on March 20th, it will be III. sidereal time, and the stars above and around us will be those we saw at 9 p. m. on December 20th, and at 7 p. m. on January 20th. At 9 p. m. on March 20th the sidereal hour will be IX.; and it is the business of these present Notes to tell what stars and star-groups may then be seen. A week before March 20th the hour IX. will fall at 9.30 p. m.; a fortnight after March 20th it will fall at 8 p. m. All the hours given here in Arabic numerals are hours of mean or local time.

Begin with the Pleiads. At XXI. they were above the eastern horizon, at III. they were nearly on the meridian and high up, at IX. they are above the western horizon — in a couple of hours more they will be below it. Nearly due west you will find them — that little sparkling cluster of five, six, seven or whatever is the number you can count. Put your opera or field glass on them, and when you have filled your eyes with the beauty of the sight, try how many you can then count. To the left of them is the red Aldebaran, the brightest of another group called the Hyades. The letter V, which the stars of this group form, is seen at its best in its present position — upside up. Use your glass here, too, and you will see some good doubles. Both Pleiades and Hyades belong to the constellation Taurus, the Bull; Aldebaran is Alpha Tauri.

To the left of Aldebaran, and about south-west at present, you will see "great Orion, sloping slowly to the west." Those three second magnitude stars close together and in line — and nearly in line with Aldebaran — form Orion's belt, a name which will explain itself if you look at the painted picture of the giant on a celestial globe. Above the belt is a bright red star, Alpha Orionis; below the belt another very bright one, Rigel — its color you may settle for yourselves. Run your glass all over Orion and enjoy the fine views, especially about the belt and the row of stars hanging below it.

Then look at the splendid star below and to the left of Orion, in line with the three in the belt. See if you can find its equal anywhere in the whole heavens. And what a beautiful color it has! By the way, what color is it? No, it's not Venus — nor Jupiter either — it's not a planet at all. It is Sirius, the Dog-Star. But it is like the planets Venus and Jupiter in that it can be seen in the daytime if you take some pains to find out the where and the when. With a field-glass it is not at all difficult to pick it out on April afternoons when it is on or near the meridian. Having picked it out and marked its position, you may lay aside the field-glass and try a mere opera-glass on it. And when you know very exactly where to look for it, you may — if your eye is fairly good — enjoy a glimpse of it without the help of a glass of any kind, and in spite of the full blaze of the afternoon sun. But your eye may smart for it for a week after.

Note the distance between Sirius and Alpha Orionis, the red first magnitude star above Orion's belt. About that same distance above Sirius you will find another first magnitude one which is Procyon, the little dog. Its distance from Alpha Orionis is about equal to its distance from Sirius; and so these three grand stars are at the three corners of an equilateral triangle. As high above Procyon as it is above Sirius — but not in the same line — there is another star of the first magnitude. This is Pollux, and the rather smaller one above it is Castor. The two are known as the Twins, and they — with most of the stars between them and Orion — belong to the constellation Gemini.

These are the brightest stars and the most conspicuous groups in the south-west quarter of the sky at IX. Get well acquainted with them, and then, if you want to know the names of the other stars you see there, and of the constellations they belong to, get a star-map and you will easily learn them from it. And do the same thing for each of the other quarters of the sky. Only a few of the principal objects can be mentioned here.

In the north-west quarter, at IX., there are two well-marked groups and one very bright star. The star is Capella; one of the groups forms the letter J, and belongs to the constellation Perseus; the other group can be imagined into a W or a chair, and belongs to the constellation Cassiopeia. This last group is now well round to the north, and not far above the horizon. It was in Cassiopeia that the Star of Bethlehem was to have appeared last year, according to the newspapers, but the event did not come off. Perseus is a little higher up than Cassiopeia, and between it and the Pleiads. Find the Beta of Perseus from your map, and then pick it out in the sky. It is the wonderful variable star Algol. Capella is the very bright, yellowish star between Perseus and the zenith. If you are not sure of Perseus, run your eye from the Pleiads upward and bear a little to the right and you can't miss Capella. It is brighter than any other star on the west side of the meridian just now, except the Dog-Star. The other stars near it belong, like itself, to the constellation Auriga.

Turn now to the east side of the meridian. There is one brightest star there which you will have no trouble in finding. Its color is reddish, its brilliancy is second only to that of Sirius, its name is Arcturus, it is nearly in line with the two outer stars in the handle of the Dipper, and at IX. it is nearly due east. Within half an hour you will find another exceptionally bright star low down on the north-east horizon. This is Vega. For a couple of hours after it rises we have above our horizon the four brightest stars that we ever see here — Sirius and Capella on the west of the meridian, and Arcturus and Vega on the east. It is only during the spring months that we can see these four at the same time in the evening.

To the left of Arcturus and nearer the horizon lies the curved string of brilliants in the Northern Crown. Lower still and further left is the trapezium in Hercules. Higher than this and still farther north — just over the spot where Vega is trying to rise — is another four-cornered figure in the head of the Dragon. The dimmest of the four is the charming field-glass double, Nu Draconis.

The Dipper and the North Star are known to every one, of course. The Little Dipper is not so easy to make out; at IX. it stretches out to the east of the North Star. Before leaving the Big Dipper look at the middle star in its handle. Its name is Mizar. That little fellow you see close to it is Alcor. A good field-glass will show a third one, nearer to Mizar than Alcor is. A small telescope will show a fourth one very close to Mizar and forming a beautiful double with it. It has lately been discovered by the spectroscope that there is a fifth one still closer than this, so very close that no telescope can show it.

The outermost star in the handle is Benetnash. To the right of it is the star called King Charles's Heart (Cor Caroli). It and Arcturus are at two of the corners of a large diamond-shaped figure. A third corner is at Spica, that first magnitude star down near the south-east horizon. The fourth one is a second magnitude star at the very tip of the Lion's tail; its name is Denebola. Between Denebola and Car Carcoli is Berenice's Hair, a good object for an opera-glass. South from Spica, four stars in the Crow form a quadrilateral. South from this a less conspicuous quadrilateral may be seen in the Cup. Very nearly due south there is a lone star between 30° and 40° above the horizon. It is Cor Hydræ. Above this is one of the smallest first magnitude stars Regulus. It and five or six of the stars above it form the Sickle, a figure easier to make out now than it was last year when Saturn was strolling about in its neighborhood. Saturn is not very far off yet. He is that bright, yellowish object to the east of the Sickle, which has not been mentioned among the stars and which you will not find on your star-map.

Saturn is a planet, and there is no room here for planets this month. But just note this one fact. The first half of April will be the best time this year to see Mercury as evening star. Look for a white, twinkling spot in the west from half an hour to an hour and a half after sun-set.

A. Cameron.

Yarmouth, N. S., February 25, 1891.

THE WOODS IN MARCH.

The woods are still sleeping
But grass is a-peeping
Out from under the snow;
The swallows are coming,
The bees are a-humming,
The sap has begun to flow.

The buds that were hidden
In brown coats are bidden
To break and let the world know
The Ice-King is quaking
And Springtime is breaking,
For sap has begun to flow.

— The Kindergarten.

MARCH.

Light-footed March, wild maid of Spring,
Your frolic footsteps hither stray,
Smiles blent with tears will April bring —
'Tis April's sentimental way —
But your wild winds with laughter ring,
While young and old your will obey:
A moment here, then on the wing,
Coquettish March, what games you play!

I know a maid as blithe as you —
Child of the Ice-King and the Sun —
At her fair feet fond lovers woo,
She floats and jeers them, every one;
And then she smiles—once more they sue.
Then blows she cold—they are undone:
Oh March, could you or she be true,
Then all were naught, so you were won.

—Louise Chandler Moulton.

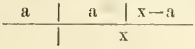
Euclid. Book II.

I.

(*Continued.*)

PROP. 6.

The rectangle contained by the unequal segments of a line when cut externally, with the square on the half line, are together equal to the square on the *mean distance* of the point of section.



$$(a+x)\ (x-a)+a^2=x^2.$$

Proof—

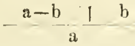
$$(a+x)\ (x-a)+a^2=(a+x)\ x-(a+x)\ a+a^2. \quad \text{(II. 1.)}$$
$$=ax+x^2-a^2-ax+a^2. \quad \text{(II. 3.)}$$
$$x^2. \quad \text{(ax. 3)}$$

Q. E. D.

PROPOSITIONS 6 AND 7 GENERALIZED.

If a line be cut in any point within or beyond its extremities, the rectangle contained by these two segments is equal to the difference between the squares on the *mean* distance of the point of section and on the half of the line.

PROP. 7.



$$a^2+b^2=2\ ab+(a-b)^2.$$

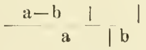
Proof—

$$a^2+b^2=(a-b^2+2\ b\ (a-b)+b^2+b^2. \quad \text{(Euc. II. 4.)}$$
$$=(a-b)^2+2\ ab-2\ b^2+b^2+b^2. \quad \text{(Euc. II. 1.)}$$
$$=(a-b)^2+2\ ab. \quad \text{(Axiom.)}$$

Q. E. D.

Cor. $\therefore\ a^2+b^2-\ ab=(a-b)^2$ (axiom — from the two equals take away 2 ab.)

PROP. 8.



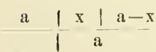
$$(a+b)^2=4\ ab+(a-b)^2.$$

Proof—

$$(a+b)^2=a^2+b^2+2\ ab. \quad \text{(Euc. II. 4.)}$$
$$=(a-b)^2+2\ ab+2\ ab. \quad \text{(Euc. II. 7).}$$
$$=(a-b)^2+4\ ab. \quad \text{(Axiom).}$$

Q. E. D.

PROP. 9.



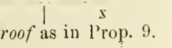
$$(a+x)^2+(a-x)^2=2\ a^2+2\ x^2.$$

Proof—

$$(a+x)^2=a^2+x^2+2\ ax. \quad \text{(Euc. II. 4.)}$$
$$\text{and } (a-x)^2=a^2+x^2-2\ ax. \quad \text{Euc. II. 7, Cor.)}$$
$$\therefore\ (a+x)^2+(a-x^2=2\ a^2+2\ x^2. \quad \text{(Axiom 2 — if equals be added to equals, etc.)}$$

Q. E. D.

PROP. 10.



$$(a+x)^2+(x-a)^2=2\ a^2+2\ x^2.$$

Proof as in Prop. 9.

PROPOSITIONS 9 AND 10 GENERALIZED.

If a line be cut in any point within or beyond its extremities, the squares on these two segments are together equal to twice the squares on the *mean* distance of the point of section and on the half of the line.

For the REVIEW].

Kindergarten Methods in Primary Schools.

SIXTH PAPER.

The fourth gift, like the third, is a divided cube, but its sub-divisions are blocks, whose sides are oblongs instead of squares. These blocks or *bricks* are two inches long, one inch wide, and half an inch thick.

Like the third, this gift is introduced as a whole cube, but here, in the parts, there is something new to be learned, and, as in all Frœbel's gifts, varieties of forms are made of life, of knowledge and of beauty.

There is a strong resemblance to the third, yet there are important differences, and then not only in the parts but in the application.

In the first exercise the third and fourth gifts are shown together for comparison and contrast. After the comparison of the whole cube it is observed that the square faces of the third are alike, but the oblongs of the fourth are not alike. The bricks will rest in three positions, standing, sitting and lying. The cubes will only stand.

Children prefer the fourth gift to the third, which shows that it assists in the progress of development.

With the eight bricks we can teach number lessons in the four rules just as we did with the cubes of the third gift. We might play that the bricks were soldiers—eight soldiers all standing in one row, then arrange them so that they will stand two in a row, etc. Still further, eight soldiers on the battlefield and one was killed. How many remained, etc.

In a language lesson given with the aid of these bricks, one day we played that the bricks were dolls and that they were ill in bed. The bricks were then laid down on their wide faces. Each little girl gave the name of the disease with which her dollies were afflicted, as "My doll has the measles." The dolls were all lying down at this period, and shortly they became so much better that they were allowed to sit up. The bricks were then made to sit upon their long, narrow faces. In due time they were so well that they were allowed to stand, and then the bricks stood on their little faces. In this imaginative lesson the children expressed their ideas beautifully, because they were perfectly at home with the word *dolls* and they learned to use the words *lying, sitting* and *standing* in their proper places in reference to the bricks without any effort. After this lesson, indicating any form they would know just what faces were meant to stand, or touch, etc.

For building purposes and invention the third and fourth gifts may be used together and many pretty forms made.

The fifth gift is a large cube made up of twenty-seven small cubes, each cube the same as the one-inch cube of the third gift, and some of these small cubes are divided into halves and quarters. We introduce fractions when we divide the whole cube, either the third or fourth gift, into halves, quarters and eighths, but in this fifth gift we may go further.

The sixth gift is a large cube also and is made up of oblongs like those of the fourth gift. Some of the oblongs are divided lengthwise and crosswise.

All these building gifts provide the child with work for his creative powers. "Children can be encouraged by this additional material to work together, and here comes in a very necessary development. The child learns lessons of control and respect for other's opinions and rights." D.

St. John, N. B.

For the REVIEW.]

"English as She is Writ."

SIR: A reserve man steals two coats, is, therefore, imprisoned for two months for which time his pay is docked. He protests and explains. Here follows the explanation, from one of those who, according to statistics, read and "write," and who inherit free spelling — can Chaucer be more free than "hour' and hower" "Rigmint" and "Ridgment," "Chesser," "cheshour" and "Chesschur?" — and who wander in the marvellous ins and outs of the English *H*.

Yours truly, W. F. S.

Streatham, London, Eng.

22 may 1890 Sir I went to Aulker [Altcar] camp wair my Ridgment Hedquarters campt At Aucker And I went too see my felow comrads And I had been drinking with them And sum of cheshour melitia joind hower company in (?) drinking in hour Canteen And wee got misced hup togethur in thair canteen togethur And that All As far As I Rember But howsumever I dont know howsumever I dont know how I got in Posetion of too Ridgmental top Coats one top Coat And Cape Belong too A oficer of the second Chesschur Rigment And the other Belong to A oficer of the Chesser meliteah And How it curd I canot tell Howsumever I came to have them in my Possetion wich I Ham sorey to say that I got too months in Prisenment Sir this is my Indentery Proper Nomber As I send you [Here a number is given wich is I send you is on My Life sisftat sir if I have Eny money to come I would Bee thankful to you to send to Mee As sune As you can sir No More at Presant.

For the REVIEW.]

Thanks.

I beg to thank Dr. Hall very cordially for his sympathy "for more light" on language teaching, so kindly expressed in the January REVIEW. It (the light) has revealed to me the encouraging fact that my plan is not, after all, so different from his as I had supposed.

LADY TEACHER.

Northumberland, N. B.

For the REVIEW.]

An Appeal.

Teachers of District No. 10:

I wish to appeal to the sympathies of you and your pupils on behalf of the orphan children of Springhill. The late terrible disaster there has elicited generous help from our people, and I would like to see children, as well as parents, educated in almsgiving. To this end let us establish a fund, to be known as the "Children's Relief Fund," to which every school in Cumberland and North Colchester will be asked to subscribe.

This plan will give many people in country districts a chance, not otherwise afforded, of assisting their suffering fellow citizens; and I trust they will do so by aiding this fund. I am sure, also, that all ratepayers will uphold their trustees in giving any small sum that can be spared out of the school funds. All amounts forwarded to me will be acknowledged through the REVIEW, together with the names of teacher and section, and promptly paid over to Springhill. Teachers and children, in the name of our common brotherhood, and by the authority of the golden rule, I make this appeal to you. What school will be the first to send its donation to the "Children's Relief Fund?"

Yours sincerely,

E. J. LAY.

Amherst. N. S., March 6, 1891.

NOW THE teachers of Philadelphia have undertaken to raise a fund for the pensioning of teachers. The association is open to all teachers, and those who withdraw after five years will receive back one-third of the dues paid in. The annual dues are 2 per cent. on salaries up to $1,000, and 1 per cent. on each $100 above $1,000, the maximum dues not to exceed $40 a year. The annuity of retired members is to be 60 per cent. of the salary at time of retirement, but no annuity is to exceed $600. Already 1,100 teachers have joined, contributing a fund of $17,000. —*School Bulletin.*

Compensations.

In a recent article in an educational paper, the experience of a certain teacher was given with a candor that could not fail to interest. This person confessed that the dreams which sweetened the beginning of the way, did not attend the path throughout; that enthusiasm faded, and inspiration failed.

Had the writer stopped there in her confession, her word might have had no special significance for us. But she goes on to relate that a reaction came; that from the ashes of the youthful glamor, arose a serene and steady brightness, which sanctified her work, and enabled her to do it in faith and patience.

There are few exceptions in life. We are faithful duplicates of one another, in our tendencies at least. Hence the interest with which we take this bit of history, and recognizing how it runs parallel to many another life, dwell on the thoughts it suggests.

James Martineau has pointed out the fact that not only do the tides of the spirit ebb and flow — a fact painfully familiar to most of us — but that they do so in obedience to a universal law; which takes the fact out of the region of individual experience, into to the common lot of humanity, even into the deep mysteries of Nature itself. It is a comforting thought. If we can hold fast to it in our next season of discouragement, it may save us from the sting of remorse, and spare us the shame of feeling that we are recreant to our calling. We have only to wait patiently until the great wave comes again, covering the unsightly drift with its calm depths.

In the reflux of inspiration, the compensations of our calling, sometimes faint and unreal, grow distinct. It is one of the necessary trials that much of our finest work is quite unknown, unsuspected by us; but in the inspired moments the contemplation of the mere possibility gives strength and courage. What matter if no certain sign comes? If we work lovingly, some souls may be the richer; and though the shy child-nature looks it gratitude in unresponsive silence, we may trust unerringly that some day the sowing will bear fruit. We cannot know what a passion of loving reverence kindness may awaken, nor what may be the influence of a sympathetic touch upon young lives.

It moved me to see, not long ago, the affection shown by a young man for his dead teacher. Although not a person of extraordinary gifts, this teacher had the power of awakening in his pupils an affection and loyalty I have never seen surpassed. The moist eyes and faltering voice of the young man, the affection and gratitude which he expressed, made an impression I shall not soon forget.

Whatever of manliness and womanliness we put into our profession is doing its work. Its quickening power is spreading from the child to the family, to the nation that it to be. By the purity of our ideals and our faithful consecration to them, we may raise the standard of national integrity. And no less than this the state demands of us.

These ringing words from Sartor Resartus have thrilled many a teacher:

"Of this thing, however, be certain: wouldst thou plant for eternity, then plant into the deep infinite faculties of man, his Fantasy and Heart; wouldst thou plant for Year and Day, than plant into his shallow superficial faculties, his self-love and arithmetical understanding, what will grow there."

The highest rewards of our calling are not its pecuniary gains, be they large or small; not even the welcome words, "well done," though they are sweet. They are found in its constant opportunities for exerting ennobling influence and giving happiness; than which life has no greater privilege, no truer blessedness.—*Common School Education.*

Good Things.

Ride no hobbies.

Do not *hire* your pupils to be studious and to obey you.

Keep whispering, leaving seats, etc., down to the minimum.

Be constantly on the alert, but beware of being over suspicious, or seemingly so.

Never lose your patience when parents unreasonably interfere with your plans.

Give dull pupils time to answer your questions. Do not flurry them by trying to hurry.

Make a few rules, and let such as you make be as general as possible, and the outgrowth of necessity.

Never command a pupil to do a favor for you, but frequently give pupils the pleasure of obliging you.

Have your school so well disciplined that you can put your strongest efforts into class work without interruption.

Do not antagonize your pupils when it can be avoided. Make them feel that you have their best interests in view in all you do.

Use a simple system of signals for calling and dismissing classes, and be careful to have pupils pass out and in quietly at intermissions.

Be not timid; know your rights and your privileges as a teacher, and maintain them, but not in a spirit that will arouse unnecessary ill feeling.

Avoid making excuses to visitors for the defects of your school. A poor housekeeper is always explaining why you do not find her house in order; so with the poor teacher.

Read not only educational journals and books, but read what the world is doing, and be prepared to talk intelligently on living topics. If you are alive, let the world know it.

In cold weather see to it that no window panes are out, and that the stove is in good working order—and, in short, that the house is comfortable, cheerful, clean and properly ventilated.

Remember the chief aim of the public schools is to make of the rising generation intelligent, honest, self-reliant, law-abiding citizens—men and women of high purposes and sterling worth.

Do not permit slip-shod work in any direction. Make your pupils feel that to fail in a recitation is a serious matter, and not to be passed over as of little or no importance. Failures in school duties are, as a rule, the beginning of failures in life.

Make every recitations *tell* in some direction. Have a definite object in view, and attain it—don't fire at random, or scatter your instructions over the entire universe in one recitation. I once saw a teacher commence with punctuation marks and end with the nebular hypothesis.

Try to work yourself and your school up to a white heat of interest and ethusiasm. If you can bring yourself to feel that you would like to put in about ten hours a day with your school for the remainder of your life, then you are accomplishing something; but beware, under such circumstances, of doing too much of your pupils' work for them. Our teachers lack life, vigor, enthusiasm. "As is the teacher, so is the school."—*C. P. Carey, in Western School Journal.*

Etiquette for Children—In Ten Rules.

1. Always say Yes sir. Yes, papa. No, papa. Thank you. No, thank you. Good night. Good morning. Never say How, or Which, nor What. Use no slang terms. Remember that good spelling, reading, writing and grammer are the base of all true education.

2. Clean faces, clothes, clean shoes and clean finger nails indicate good breeding. Never leave your clothes about the room. Have a place for everything, and everything in its place.

3. Rap before entering a room, and never leave it with your back to the company. Never enter a private room or public place with your cap on.

4. Always offer your seat to a lady or old gentleman. Let your companions enter the carriage or room first.

5. At the table eat with your fork; sit up straight; never use your toothpick (although the Europeans do), and when leaving ask to be excused.

6. Never put your feet on cushions, chairs or table.

7. Never overlook any one while reading or writing, nor talk or read aloud while others are reading. When conversing listen attentively, and do not interrupt or reply till the other is finished.

8. Never talk or whisper at church, or public places, and especially in a private room where any one is singing or playing the piano.

9. Loud coughing, hawking, yawning, sneezing and blowing are ill-mannered. In every case cover your mouth with your handkerchief (*which never examine, nothing is more vulgar, except spitting on the floor.*)

10. Treat all with respect, especially the poor. Be careful to injure no one's feelings by unkind remarks. Never tell tales, make faces, call names, ridicule the lame, mimic the unfortunate, or be cruel to insects, birds or animals.—*National Educator.*

Education in Finland.

Education is the panacea to which the Finnish Diet invariably has recourse against all the evils that afflict the land, and in this case technical education was the form in which it was prescribed. So rapidly was the remedy applied that Finland, whose population is smaller than that of many a Russian government and less dense than European Russia, actually possesses more agricultural schools than European and Asiatic Russia combined: and agricultural schools constitute but one of the numerous categories of technical schools opened since 1863. There are thus sixteen agricultural schools, one of which belongs to the higher type of educational establishments, what in Russia is termed an academy, and eighteen dairy-farming schools, of which one bears the same relation to the other seventeen that a university bears to a grammar school. Among the other special educational establishments, the object of which is to enable the people to turn the meagre gifts of nature to the best account, one should not forget the school of Forestry with a very efficient staff of teachers, the Institute of Forestry, which receives the pupils who have passed through the school, the Grooms' School, in which those who intend to devote themselves to improving the breed of horses receive theoratical and practical instruction in all matters bearing upon this calling; the cattle-breeders' school, two schools of horticulture and two farmers' schools.—*Fortnightly Review.*

The Fifteen Minutes Before School.

How to secure the best discipline during that "bad quarter of an hour" before the session, when one is perhaps obliged to stand, Janus-like, 'twixt schoolroom and dressing-room, is a problem with many teachers. Many and ingenious are the devices employed by the skilful teacher to catch and hold the attention, and to direct, even for so short a time, to some useful end the energy which is otherwise inactive or expended in disorder. To accomplish this, these devices must be both varied and interesting, and should demand just a little less than can be done in the given time, leaving a margin of two or three minutes for the teacher to give or write what is asked for, for slates to be quickly exchanged and corrected, or for papers or books to be collected. In some schools this has been so clearly managed as to bring fully four-fifths of the class into their seats ten minutes before the hour, thus lessening the chances of tardiness, while its advantages in discipline and training the attention are evident.

It is well to vary the programme every day or two, as the secret lies in withdrawing the exercise just *before* the interest begin to flag. This means work for the teacher, who will find it pays, however, in the end. Below are given some things used in the first and second year programme grade of a Boston school:

I. A reading-table supplied with the *Youth's Companion*, *St. Nicholas*, *Wide Awake*, etc.

II. A set of sixty cards, each containing a problem in written arithmetic. Each pupil takes with the card a pencil and a slip of paper. The name, number of card and solution of problem are written and all cards are collected two minutes before the hour. As each card contains a different problem, there is no chance for dishonesty. The names of pupils perfect should be written on the board the next day.

III. Four or six lines of a poem, or a short selection written on the board, to be committed to memory.

IV. One or more riddles to be guessed, each successful guesser to furnish a riddle for the next time.

V. Taking words to pieces to make other words. (For instance, make twelve words from "satisfactory.") Of this there are endless varieties.

VI. Maps to be traced from the geographies.

VII. Five questions in geography written on the board. Pupils write answers or give them orally.

VIII. A skeleton story written on the board. Pupils read silently, fill in blanks and one pupil finally reads.

IX. Ten or more questions in combinations of numbers to be copied from the board and answers written.

X. (1) Directions for drawing a certain figure written upon the board. Pupils draw, or

(2) Figure drawn on the board, and pupils copy.

For higher grades there should be supplementary histories, geographies and books of poetry and travel, together with map-drawing or design at the board.

Each teacher must select and adapt to her own need the material for these exercises, the object of which is not merely to keep the pupil busy, but to stimulate his thought and awaken his intelligence. —*Common School Education.*

The World's Greatest Cataract.

The interior of Labrador undoubtedly is the largest unexplored area on this continent. Up the Grand River, which empties into the Atlantic Ocean at Hamilton inlet, are the Grand Falls, which, if everything is true about them that is reported, are the most stupendous falls in the world. They are only about 160 miles up the river, but only two white men have ever seen them. Mr. R. F. Holme, three years ago, went from England to visit the Grand Falls. He organized a little party to accompany him inland, and arrived within about fifty miles of the falls, when he was compelled to return on account of the failure of his provisions. The Labrador Indians say these falls are haunted, and they carefully avoid them, believing that they will die if they look upon them. The two white men who have seen them are Mr. Maclean, who, as he was ascending the river, in 1839, was stopped by the falls, and Mr. Kennedy, who over thirty years ago had charge of Hudson Bay post in Labrador. Mr. Holmes says the height of the falls is not certainly known, but, in some respects, there is little doubt they are the greatest in the world. Though inner Labrador is so inadequately known, we are aware that it is a vast tableland whose limits are quite clearly defined. In the southeast the descent from the tableland is quite sudden, and almost immediately after leaving the plateau a level is reached that is very little above that of the sea. The Grand Falls are the place where the Grand River tumbles over the edge of this tableland, and almost the whole of the great top is effected in this one descent. Professor Hind gives the height of this plateau as 2,240 feet. It has been estimated that the region at the foot of the falls is only 200 feet above sea level, and that, therefore, the waters of Grand River have a perpendicular descent of about 2,000 feet.—*Goldthwaite's Geographical Magazine.*

A Case of Discipline.

One afternoon two bright boys in my grade, D primary, did not come in from recess. Upon inquiry I learned that they had gone home. The next morning they came to school, one with a note from his mother asking that he be excused for leaving school the day before, explaining that they went too far away from the building and could not get back in time, so they went directly home. The other boy had no excuse. I detained them at recess, and we had a talk as follows:

"Where did you go yesterday afternoon at recess?"

"To the common for a race."

"Did you hear the bell?"

"Yes, ma'am; but we could not get here in time, and did not want to be tardy."

"Where did you go then?"

"We went home."

"You know the rule about leaving the grounds, and that the school has laws which we all are bound to obey, just as we obey the laws of our country, do you not?"

"Yes, ma'am."

"What is done to those who break the laws of the country where they live?"

"They are put in jail."

"Have to go to prison, or be hung."

"Well, if you were a teacher, what should you do with boys who did what you have done?"

"Punish them."

"How would you punish so as to help them remember not to do wrong again? Think awhile and tell me."

After a few minutes of whispered consultation and nodding of heads, two little hands were raised.

"What have you thought of for a punishment?"

"You might keep us in at recess for a week."

I accepted their decision and let them try it. They submitted manfully to the privation, kept at work with great diligence, not once making a move to go out with the rest, although it was fine spring weather and the days were beautiful.

The third afternoon I thought they were entitled to a reprieve, so I explained to them that law-breakers sometimes were pardoned if they behaved well and showed themselves inclined to do right in the future; that although they had done wrong and deserved to be punished, they went directly home and told the truth about it. I hoped they would not forget if I let them off with a shorter term than a week.

Happier, or more obedient boys than they were for the remainder of the year you would not wish for.

These boys were not quite seven years old.—*School Journal.*

Male Teachers.

"To many persons it will doubtless be a surprise to learn how few men are engaged in teaching the Public Schools of Philadalphia. The teachers now in the service number, all told, ninety-three men and two thousand five hundred and fourteen women. Of the men, thirty-five are engaged in the High School, the Manual Training School and the Normal School. Fourteen are Supervising Principals. This leaves but forty-four men as teachers for all schools other than those mentioned. In several school sections, there is not a man engaged in teaching in any of the schools. This state of affairs did not always exist here, and it is peculiar to this city. In my judgment, it should not continue longer than is absolutely unavoidable. Women will always largely preponderate in numbers in our teaching force, and rightly so. In the primary, and mainly in the secondary grade, as well as in grammar schools for girls, women's work is appropriate and indispensable. We cannot, however, close our eyes to the fact that the teaching force in our grammar schools for boys should be greatly strenghtened, inasmuch as calls for better results are becoming urgent. The women themselves who teach in these schools complain that it is a more difficult and burdensome task to teach the larger boys than to teach girls of the same grade of attainment; and they urge that fact as a plea for increased pay for assistant teachers in boys' grammar schools. No single instances has yet come to my knowledge wherein a teacher in a girls' school of any grade has expressed a desire to be transferred to a boys' school of the same grade; but the contrary is of frequent occurrence. It is the character and work of the teacher that impart real power and value to any school; and I take the position that to deprive a girl of the benefit of such influences as are derived only from contact with a refined and cultivated woman during her school life, and to confide her education entirely to men would be to commit a serious blunder. In like manner, I hold that to deprive a boy during the educational period of the advantages which he would receive in the development of mind and character from daily association a sturdy, manly man, is no less a grave mistake. A boy who has received his later school training under a man will go forth, other things being equal, to the duties of citizenship more manly, and with a better equipment for his work in the world than one whose school training has been left entirely to women."—*Annual Report of Superintendent MacAlister for 1890.*

One of Dr. Arnold's pupils said: "To me his lectures were like the opening of the heavens. I felt that I had a soul. His noble views, unfolded in glorious sentences, elevated me into a higher world; they changed my whole nature."

In the recesses of your being earnestly ask yourself these questions: How many good books have I read since I began to teach in this school? How mady boys and girls are perceptibly better physically, intellectually and morally because of my teaching and influence? How many evenings during the term have I devoted to study, how many to fantastic frivolity, empty gossip, or unseemly revelry? How many recitations have I conducted listlessly, mechanically, monotonously, impatiently? How much time have I given to preparation for lessons? How many times have I punished or revoked in anger? How oft has the sun gone down on my wrath? How many times have I used slang in the school-room? Looking back over my work do I truly think that it can be said of me now or hereafter, "Well done, good and faithful servant?"

The Prussian Ministry of Education has just admonished the school teachers in the rural districts under its supervision that numerous steps must be taken at once to preserve the health of the scholars. "Among the immediate and inexpensive measures," says the circular letter, "are the exact adaptation of the back of the school bench to the shape of the pupil's back, general cleanliness, add especially the prevention of dust, which, as all doctors know, is the medium of bacilli, and thus the cause of almost all skin and eye diseases among school children. Regard for the health of the eyes must dictate also the earliest possible abolition of slates. If no substitute can be found the use of slates must be confined at least to the first two years in the primary classes. The children must be so accustomed to the pen in these two years that all exercises from the beginning of the third year can be executed with pen, ink and paper. Slates are so injurious to the eye that they should be used only in cases of absolute necessity."

The important thing is not so much that every child should be taught, as that every child should be given the wish to learn. What does it matter if the pupil knows a little more or a little less? A boy who leaves school knowing much, but hating his lessons, will soon have forgotten all he almost ever learnt, while another who had acquired a thirst for knowledge, even if he had learnt little, would soon teach himself more than the first ever knew. Children are by nature eager for information. They are always putting questions. This ought to be encouraged. In fact we may, to a great extent, trust to their instincts, and in that case they will do much to educate themselves. Too often, however, the acquirement of knowledge is placed before them in a form so irksome and fatiguing that all desire for information is choked or even crushed out, so that our schools, in fact, become places for the discouragement of learning, and thus produce a different effect from that at which we aim. In short, children should be trained to observe and think, for in that way there would be opened out to them a source of the purest enjoyment for leisure hours, and the wisest judgment in the work of life.—*Sir John Lubbock.*

QUESTION DEPARTMENT.

A very simple question, asked by a little girl, has proved to be anything but simple in its solution. The question is as follows: Why is the rainbow arched rather than any other shape?

One has a hazy idea that the form is caused by the light striking the falling rain-drops; but to get a complete and yet a simple answer to the question has not been easy. Will you kindly give the solution needed in your valuable educational organ and oblige a group of enquirers, whose scientific knowledge is not the most profound. E. F.

The question is as to the form of the rainbow. This form is that of a bow — an arch — an arc — a part of the circumference of a circle. The higher the sun is, the smaller is the arc. If the sun is in the horizon, we see a whole semi-circle. If, at such a time, we were to measure the rainbow with a sextant we should find that its highest part was about 40° above the horizon, and that the part of the horizon spanned by the bow was a little over 80°. This rainbow, then, is half of the circumference of a circle whose radius is 40°. And the centre of the circle will be found to be that point in the sky directly opposite to where the sun is. Let us call this point the anti-sun. If the sun is above the horizon, the anti-sun will be below it, and the rainbow will be less than a semi-circle, but it will be found on measurement to be still an arc of a circle whose radius is 40°, and whose centre is in the anti-sun. If the sun is higher than 40° there will be no rainbow at all — at least no "primary" bow, which is the one considered here.

These are the chief facts as to the form. Why are these observed facts what they are?

The "hazy idea" is correct. To clear away the haze, take paper and pencil, and sit down and calculate the course of all the sun-rays which fall on one rain-drop. You will find that most of them leave the drop in lines that diverge from each other, "and through this divergence become so enfeebled as to be practically lost to the eye." But "at one particular angle the rays emerge from the drop almost parallel to each other, being thus enabled to preserve their intensity through long atmospheric distances." (Tyndall.) This angle is a little more than 40°, and these rays from this one rain-drop enter a spectator's eye and make him see a little bit of a rainbow at a spot on the sky 40° distant from the anti-sun. What is done by this one drop for this spectator will be done for him also by every other drop which is so situated that the angle at the drop, contained between straight lines drawn from it to the sun and to his eye is an angle of 40°. The rays sent to his eye by every such drop will make him see a little bit of a rainbow. And every such little bit will be at the same distance of 40° from the anti-sun, that is, they will be spots on the circumference of a circle having the anti-sun for centre. And if the drops are close together, these spots or patches will be close together also and will form a continuous arc or arch or bow. C.

1. G. P. McL.—Please give an account of Foucault's experiment with the pendulumto prove the earth's rotation.

ANS.—Foucault observed that a pendulum vibrating in a given plane offered resistance to a change of the plane. A wheel in rapid rotation, as in the gyroscope, also offered resistance to a change of its plane. A disk or a hoop, or a wheel will remain erect (in a vertical plane) so long as it is spinning along with sufficient velocity. But when the velocity becomes small they incline to one side or the other, and eventually fall. Therefore, he concluded, any body in motion in a plane will keep moving in the same plane unless some force is exerted to change its plane of motion. If a large domed building, then, should be built exactly over the North Pole of the earth; and from the apex of the dome a long pendulum should be suspended on a frictionless pivot allowing rotation which would keep vibrating for, say twenty-four hours, he thought that should the pendulum be started vibrating in the plane of the constellations Hercules and Auriga, for instance, it would swing during the whole day in the direction of the same stars, while the world with the building would turn around it. If the domed building were circular the pendulum bob would, therefore, appear to change its plane of vibration with respect to the walls of the room fifteen degrees every hour, or 360° in twenty-four hours. But he could not get his building over the north pole. And in Paris his building would not turn round horizontally 360° in every twenty-four hours. And if he went to the equator it would, from its position on the earth, not turn around horizontally at all during a revolution of the earth. From trigonometrical calculation he found that at the pole his pendulum should make an apparent circuit of 360°×1 in 24 hours; at the equator, 360°×0; at intermediate, 360°×sine of latitude. The sine of 90° = 1; of 0° = 0, etc. Then he said: If I suspend such a pendulum from as lofty height as I can in Paris, and let it vibrate from one side of the room to the other, so that a pointer from the base of the bob will just make a mark on the crest of a neat circular ridge of sand, I will expect to see the ridge of sand scored by the changing plane of the vibrating in twenty-four hours to the extent of 360°×by the sine of the latitude of Paris; or in one hour, 15°×sine latitude of Paris. And it happened as he expected. We understand the experiment has been tried in Nova Scotia with good results. In one hour at the pole the theoretical deflection of the plane of vibration should be 15°. In the Atlantic Provinces, latitude 45°, it should be 15×sine 45=15°×·707=10° 6+. The Eiffel tower in Paris is now utilized to suspend a large pendulum to illustrate this law.

F. L D—Please answer the following questions: 1. What is the best book on zoology for beginners? 2. Parse the following: "There is a foe there" 3. In Grade V of the course of instruction the peculiar structure of the stomach of the cow, horse, dog, etc, is to be taught orally. If a teacher has not studied it, from what books will he derive information?

1. The "Guides to Science Teaching," published by D. C. Heath & Co., Boston, are excellent for the beginner in Natural Science. Packard's Zoology is an excellent work. 2. "There" is a preparatory adverb, *preparing* the way for the subject, which thus may come after the verb. The second "there" is, of course, the true adverb of place. 3. Any good work on Zoology will furnish the information. The small manual that accompanies Prang's charts will give the desired information in a small space.

FERNELIA.—Please explain the working of the 8th question, 101st page, 63rd exercise, Sangster's arithmetic, second edition, and confer a favor on yours truly.

$\frac{2}{3}$ of the longer=$\frac{3}{4}$ of the shorter; therefore $\frac{1}{3}$ of the longer=$\frac{1}{2}$ of $\frac{3}{4}=\frac{3}{8}$ of the shorter. Hence the longer=$\frac{3}{8}\times3=\frac{9}{8}$ of the shorter. The whole tree=longer + shorter=$\frac{9}{8}+\frac{8}{8}$ of shorter=$\frac{17}{8}$ of the shorter. If 136 ft.=$\frac{17}{8}$ of the shorter, $\frac{1}{17}$ of 136=8=$\frac{1}{8}$ of shorter. Hence shorter=8×8=64 ft.; and longer =136−64=72 ft.

1. TOM.—What territories of the U. S. have become states within the last five years? 2 What qualifications are necessary in order for them to become such? 3. "Nashville, Jan. 25th. During a snow-storm here yesterday countless numbers of small fish fell. They were small and resemble carp." In that despatch how do you account for those fish falling?

1. Montana, Washington, North Dakota, South Dakota—all admitted to the union in 1889. 2. They are made states by special act of Congress. 3. The snow storm was all right, no doubt; but as for the fish, dear Tom, we are afraid you will have to add that to the long list of "fish" stories.

AMONG THE SCHOOLS.

The new St. Mary's school building in Halifax is in a charming position, in front of a fine tree-shaded park. The appointments of the building are superior, showing the latest improvements. At the commissioner's examination, the esthetic appearance of some of the rooms was especially deserving of praise, as well as the general efficiency of the pupils.

The University of Dalhousie is contemplating, we understand, still further extension of its work.

From the *Sydney Academy Record*, now in its third volume, we find that this Academic institution is second to none in its efforts to do good work, and in the enthusiastic loyalty of its students. All the elements for a good *record* there.

R. J. MacDonald, B. A. (Dal.), late principal of Baddeck Academy, is editor of the Medical College department of the *Dalhousie Gazette* this winter.

BOOK REVIEWS.

Bellum Helvetium. For beginners in Latin. pp. 279. Introduction price, $1.00. In Latinum, Part I. Exercises based upon the first four books of Cæsar's Commentaries. pp. 124. Albert & Scott, publishers, Chicago. The first of these books, containing Cæsar's campaign against the Helvetii, has been prepared with the object of teaching Latin as a living language. From a careful perusal of it, we are satisfied that the authors have not only made this possible, but that under the direction of a competent and enthusiastic teacher instruction in Latin from the beginning may be made one of the most delightful and useful of language studies. The composition of Latin words is introduced from the first and persistently followed Writing from dictation and translation are begun. Paradigms of declensions and conjugations are introduced gradually. The plan of the work, if carried out, cannot fail to make an excellent mental drill, not only in Latin but in English. The second book, mentioned above, incorporates much of the admirable plan of the "Bellum Helvetium," and is intended for more advanced students.

The World's Literature. A course in English for Colleges and High Schools, in four parts Part I. pp. 316. Albert & Scott, publishers, Chicago. The plan of this work is to present, as a basis of study in literature and history, some of the most striking compositions of the world's best authors, mingled with history and criticism. The following table of contents of Part I. will illustrate: Chap. I. and II., Origin of the Myth according to Ruskin; III Different Theories of the Myth; IV. Carlyle's Theory of the Myth. V.–IX. Select translations from the Iliad; X.–XIII. Selections from the Odyssey; XIV. Criticisms on the women of Homer; XV. The period between Homer and the first Olympiad—1,000 B. C. to 776 B. C.

Shakespeare's Hamlet, price 2s. 6d.; Scott's Lay of the Last Minstrel, Cantos IV.–VI., price 1s. 3d.; Tennyson's The Coming of Arthur and The Passing of Arthur, price, 2s. These works have recently been published by MacMillan & Co., London and New York. They are both cheap and excellent and admirably adapted for the student and teacher. All are published in a convenient form, clear type, with introduction in each case, giving the history, plot, etc., of the poem, will full explanatory notes of all the difficult textual passages. The editors are careful scholars and critics, and their work has been excellently done.

From Colony to Commonwealth; price 70 cents. Publishers, Ginn & Co, Boston. This consists of stories of the Revolutionary days in Boston suitably illustrated with maps and portraits The book is an attractive one, and the stories interesting and well told.

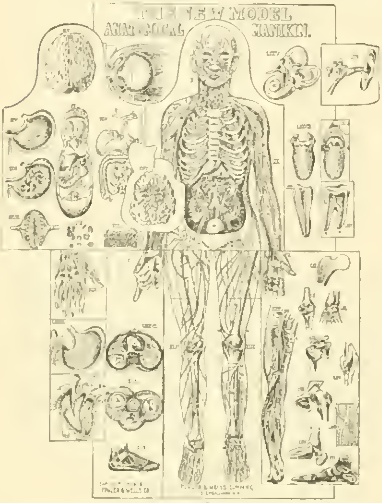
The Reproduction of Geographical Forms, by Jacques W. Redway; paper, price 25 cents. Publishers, D C. Heath & Co, Boston. This is a cheap and admirable little work. It is divided into two parts—Part I. treating of Sand and Clay Modelling with respect to Geographical Forms. Part II. Map-drawing and Map-projection. The teacher can, with a careful preparation of the subject, from the hints in this excellent manual, make geography a study of the greatest interest and pleasure as well as an admirable discipline and training of the observing powers

Tales of Troy, for boys and girls, translated and adapted from the German by Charles DeGarmo. Cloth; postpaid, 60 cents. Public School Publishing Co., Bloomington, Ill. This book consists of stories of the most stirring events of the Trojan war, as narrated in the Iliad and related literature. The design of the book seems to be to arouse the interest of children of from nine to fifteen years of age in these springs of literary culture, by a form of narration at once classic and child-like. These stories of the heroic deeds of old will prove no less attractive to the children than the trashy, sentimental and often vicious narrations that make up so large a part of recent juvenile literature, while the literary and ethical value of the two are not to be compared on the same day.

Current Periodicals.

Littell's Living Age. Recent numbers contain the following interesting articles: Winter in the Country of the Passion Play; Statesmen of Europe, and A Musical Village in Yorkshire; A Tour in Burmah; The Responsibility of Reading; The Applications of Geometry to Practical Life, with instalments of "Madeleine's Story" and "Messer Antonio's Revenge" and poetry. For fifty-two numbers of sixty-four large pages each (or more than 3,300 pages a year) the subscription price ($8) is low; while for $10 50 the publishers offer to send any one of the American $4.00 monthlies or weeklies with *The Living Age* for a year, both postpaid. Litell & Co., Boston, are the publishers.... *St. Nicholas* for March contains the usual choice illustrations with interesting reading matter. Two of the most valuable articles are "My Autograph Book," illustrated with letters and autographs of many eminent men; and the "Land of the Midnight Sun."....*New England Magazine* for March is an admirable number, both in illustrations and reading matter. The opening article is "Harvard College During the War of the Rebellion;" and other good articles are: "Early History of Electricity in America," "A Master from the States" (a capital school story)....*The Kindergarten* (Chicago) for March has a beautiful frontispiece, entitled, "Our Nursery," containing a group of happy children who are being instructed in the principles of Frœbel's teachings.

THE NEW MODEL ANATOMICAL MANIKIN.



PARTIALLY OPENED.

This is a combination of Charts of portions of the human body hinged so as to lie over one another, and to be opened or dissected, exhibiting the general anatomy in all its parts and their relation to each other, and mounted on a base 18x36 inches. The figure represents the adult human form on the scale of one-half the size of life the entire work being done in brilliant colors by the most improved Chromo-Lithographic processes on fine cloth-lined material, highly finished, being strong and durable as well as handsome, and made expressly for this purpose.

The work has been done under our special direction by an artist who has had many years' experience in making anatomical drawings, and made the original designs for this in consultation with eminent physicians of this city and the best foreign and American authorities.

In addition to the dissections of the body there are a number of special manikins of various parts, mounted on the margins of the chart, some of them much larger than life, including illustrations of the effects of stimulants and narcotics on the digestive organs, the throat, the brain and the nervous system.

When not in use the manikin folds together like a book, and when closed is about eighteen inches square.

The Manual is not only a key, but a comprehensive work on the physiological functions of all the parts, and adds much to its value, the two constituting a complete text-book, and can be used independently of any other work.

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FACULTY OF ARTS—(Opening Sept. 15th. 1890).
DONALDA SPECIAL COURSE FOR WOMEN—(Sept. 15th).
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry. (Sept. 16th). Increased facilities are now offered in this Faculty, by the erection of extensive workshops, which will be ready for this session.
FACULTY OF MEDICINE—(Oct 1st).
FACULTY OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE—(Oct 1st).
FACULTY OF LAW—(Oct. 1st)
McGILL NORMAL SCHOOL—(Sept 1st).

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ARBOR DAY NUMBER.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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Editor for New Brunswick.

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EDITORIAL NOTES.

THE early issue of our Arbor day number, its many suggestions and practical articles will give an impetus to the observance of the day throughout the Atlantic Provinces, and make, we hope, the first year of the last decade of the 19th century, a red letter one in *successful* tree planting.

THE observance of Arbor Day began in Nebraska in 1872. On the 10th of April of that year more than one million trees were planted. Between 1872 and 1888 nearly two thousand seven hundred and fifty million trees were planted throughout that State.

ARBOR DAY should be celebrated wherever there is a school. Its specific objects—the encouragement of forest culture and preservation, improving and beautifying the surroundings of school and dwelling houses—should be inculcated. It should be a district holiday.

IF the members of the agricultural and horticultural societies, where founded, would encourage and assist the schools on Arbor Day, it would create an interest among the rising generation in the objects of these useful organizations.

ARBOR DAY in Inspector Carter's district—St. John, Charlotte and part of Kings—will probably be on Friday, May 15th.

THE Summer School of Science for the Atlantic Provinces meets in July next at Antigonish, N. S. Fuller announcements will be given in May REVIEW.

READERS of the REVIEW will join us in acknowledgments to Prof. Lawson, Ph. D., of Dalhousie University, W. F. Ganong, A. M., of Harvard University, and Mr. J. Vroom, St. Stephen, N. B., for interesting and valuable contributions to this number.

Do not be discouraged if some persons try to throw cold water on your efforts to create an interest in Arbor Day. "What's the use?" will be heard from many. If you become discouraged and give up, it is a question whether you are capable of succeeding in any undertaking that requires tact and energy.

THE teacher that by intelligent and conscientious work arouses activity and directs thought leaves an impress on the minds of the community for all time. If a taste for order and beauty be implanted, the ornamented grounds and houses will always be a monument to that teacher's taste and intelligence.

LET the programme for Arbor Day exercises be arranged with a definite object in view—that object being to carry out the spirit and letter of the requirements of the school law. If only a programme of speeches, dialogues, recitations, be carried out without reference to carefully planned and systematic work on the school grounds, it is a sham.

BY all means secure the active co-operation of the boys and girls in tree-planting and other improvement. Those teachers who have secured and intelligently directed this in past years know its value. Those who have not should begin at once to awaken an interest among the boys and girls. That will arouse the district.

AT a recent meeting of the executive of the St. John County Teachers' Institute it was decided to engage for the next meeting, in December next, the services of Inspector Metcalfe, an eminent educationist of Boston. Mr. John Brittain of the Provincial normal school will also be asked to address the teachers. The Institute promises to be a very instructive one, and, coming when it does, will, no doubt, be attended by teachers from other sections of the Province, as the date of its meetings are such as to permit it.

Sixteen out of a graduating class of forty-eight who received the degree of M. D., C. M., at the McGill University, Montreal, in March, were from the Atlantic Provinces.

Future school houses should be built with due regard to light, ventilation, ornamentation and playgrounds.

We have received the past year's report of the Chief Superintendent of Education for New Brunswick. Compared with the corresponding term in the previous year, there was a gain in the first term of 17 schools, 48 teachers, and 2,286 pupils. In the second term there was a gain, computed on the same basis, of 12 schools and 20 teachers.

The details of this and other educational reports received will be dealt with in future numbers of the Review.

From the New Glasgow High School *Monthly* we learn that the New Glasgow School Board proposes to erect a high school, to cost from $10,000 to $20,000.

The teachers of Newfoundland have organized an association called the "Newfoundland Teachers' Association." Mr. Bancroft, of Bay Roberts, is president, and his efforts are spoken of in the highest terms of praise. We hope that this will be the impulse which will lead to greater things. The history of education in other countries outlines a glorious career for such efforts; but it will require much patience and intelligent hard work.

A brilliant meteor, comparable, from the reports, to the one described in the Review October, 1887, passed northwardly over the eastern extremity of Newfoundland on Saturday, 28th March, at about 10:30 p. m., St. John's, Nfld., time. The meteor appears to have exploded towards the end of its course with a magnificent shower of fragments. Its altitude and course, as seen from more than one point, and its size as compared with the moon, would be necessary to estimate its real size and distance. The sound made could not be expected to be heard until several minutes after it had passed. If the time were noted it would tend to rectify observations of altitude.

Ex-Inspector Oakes, now Principal of Horton Collegiate Seminary, may be regarded as the founder of Arbor Day in New Brunswick. In the two years, 1885 and 1866, before Arbor Day was adopted by regulation, there were planted in his inspectorate, chiefly through his exertions, nearly two thousand trees. In 1884 there were probably not twenty-five school grounds in the province ornamented with transplanted trees. Of these the St. Stephen High School and the Marysville school were good examples. Not one of the grammar school grounds had any trees. Some town and city grounds were shaded by trees outside the school limits. Up to the present year there have been planted at least 27,000 trees, or an average of about eighteen to each school district in the Province.

Mr. J. Frank Owens, A. B., of Chatham, has been appointed to the principalship of St. Dunstan's School, Fredericton, made vacant by the death of J. Meagher.

Recent numbers of *Garden and Forest*, New York, contain many fine articles on forest trees, ornamentation of grounds, etc. These are well worth the attention and study of those interested, especially at this season of the year.

Attention is directed to the advertisement of the Arbor Day Manual on another page.

Miss Carman, teacher at Pennfield Ridge, Charlotte County, by means of a concert, has been able to procure some needed school apparatus and a school flag, which, it is proposed, to use for the first time on Arbor Day.

Miss Kerr and Miss Erb, of Beaver Harbor, have aspirations in the same direction. This idea of Arbor Day celebration is a good one, and is worthy of imitation.

The reports of the New Brunswick school inspectors for the last year should be carefully read. They speak of success and of failure. Where failure has occurred once it need not occur again. Sluggishness and lack of intelligent interest are the chief drawbacks. These can be overcome. The successful work of the last and previous years should be a strong incentive to a greatly increased effort this year.

Arbor Day in Ontario. — The Minister of Education in Ontario in his report says:

> "Arbor Day has now become one of the most interesting and profitable holidays in the year. In 1885, 38,940; in 1866, 34,087; in 1888, 25,714; and in 1889, 21,281 trees were planted. In a very few years every rural school in the the Province will have its pleasant, shady bower, where the pupils can find shelter from the scorching sun during the summer months, and where their taste for the beautiful in nature will find some gratification."

May we be able to say the same for our own Provinces.

HOW TO DO IT.

Inspector Mersereau says in his last report that, "The success or failure of Arbor Day proceedings depends entirely on the teacher in charge of the school." This is true. On the part of many teachers the observance of the day is a merest farce, and it is only done at all to secure a half holiday. They make no secret of their object, do not strive to interest pupils or parents, have no fixed plan of observance laid out, set out a twig or two under the windows that may live or be there at least till the next visit of the Inspector, after which it is no matter until next year. Such a teacher is useless any way, and may as well squander the time of the children by such a performance as in any other way.

The teacher who meets with the most success, first interests the children, who bring it to the notice of the parents. After the pupils are inoculated and the parents partially so, the teacher calls upon the latter, and, at least, secures the promise of their attendance, and may, perhaps, arrange with some of them to have some particular work done that is needed. The main thing, however, is to get all to come.

ORIGIN OF SOME CULTIVATED PLANTS.

Mr. John Brittain, instructor of Natural Science in the Normal School, Fredericton, makes a valuable suggestion to the readers of the REVIEW, the object of which is to illustrate the mode of growth and how to study the origin of some of our cultivated plants: "Little interest is taken by most of our young people in cultivated plants. For instance many have never noticed that carrots blossom, and that the cereals are grasses. A bed might be sown containing parallel strips of timothy, wheat, rye, barley. The growth of the plants could then be watched. The pupils would find out that they are all monocotyledons, are endogens, have jointed stems, flowers, with stamens, that their fruits are grains. They would then understand why they are all included in one family — the great grass family. Another bed might be planted with biennials — the seeds being sown in one row, and some of last year's plants in the adjacent row — carrots, turnips, cabbages, beets, parsnips. They could be led to observe that the large amount of material stored up during the first season is used up during the second. An analysis of the flowers on the plants of the second year would show that these useful plants are closely related to wild ones growing about the fields. The cabbage and turnip belonging to the Cress Family, and closely related to wild mustard; the carrot and parsnip to the Umbelliferæ, the same order as the poisonous cowbane and caraway; the beet to the same family as the common pigweed. The children would then be prepared to believe that these vegetables were once wild plants like their relatives, and the changes effected by long cultivation could be studied.

Native Trees and Shrubs.

The following list embraces the native trees and principal shrubs found in New Brunswick and Nova Scotia, with a small added list of those most generally cultivated. The larger shrubs are marked thus (*); the smaller thus (†). The latter is by no means a complete list, but embraces chiefly such shrubs as the writer thinks would be suitable for planting in corners of the school grounds, or for hedges. To the scientific name of the tree or shrub there is added, in parenthesis, the common name or names.

G. U. H.

St. John, N. B.

1. **Tilia Americana.** (American Linden. Basswood. Lime-tree. White-wood. Pumpkin-wood.)
2. **Ilex verticillata.†** (Holly. Black alder. Winterberry.)
3. **Nemopanthes fascicularis.†** (Mountain Holly. Canadian Holly.)
4. **Acer Pennsylvanicum.** (Striped Maple. Whistlewood. Striped Dog-wood. Moose-wood.)
5. **Acer spicatum.*** (Mountain Maple.)
6. **Acer saccharinum.** (Sugar or Rock Maple.)
7. **Acer dasycarpum.** (White or Silver Maple.)
8. **Acer rubrum.** (Red or Swamp Maple.)
9. **Rhus typhina.** (Stag-horn Sumach.)
10. **Prunus Pennsylvanica.** (Wild Red Cherry.)
11. **Prunus Virginiana.*** (Choke Cherry.)
12. **Prunus serotina.** (Wild Black Cherry.)
13. **Rosa Carolina.†** (Swamp Wild Rose.)
14. **Rosa lucida †** (Common Wild Rose.)
15. **Pyrus Americana.** (Mountain Ash. Rowan Tree.)
16. **Cratægus coccinea.*** (Crimson-fruited White Thorn.)
17. **Amelanchier Canadensis.** (Shad-bush. Serviceberry. June-berry. Local names,—May-pear, Bilberry.)
18. var. **oblongifolia.*** (*Smaller — leaves white woolly underneath when young.*)
19. var. **oligocarpa.†** (*Smaller than No. 2.*)
20. **Hamamelis Virginiana.*** (Witch-Hazel.)
21. **Cornus circinata.*** (Round-leaved Cornel or Dog-wood.)
22. **Cornus stolonifera.†** (Red-osier Dog-wood.)
23. **Cornus paniculata.*** (Panicled Cornel.) *Only in N. S.*
24. **Cornus alternifolia.*** (Alternate-leaved Dog-wood.)
25. **Sambucus Canadensis.†** (Common Elder.)
26. **Sambucus racemosa.†** (Panicled Elder. Scarlet-berried elder.)
27. **Viburnum lantanoides.†** (Hobble-bush. Wayfaring Tree.
28. **Viburnum Opulus.*** (Cranberry-tree. High Cranberry-bush.)
29. **Viburnum dentatum.*** (Arrow-wood)
30. **Viburnum cassinoides.*** (White-rod.)
31. **Viburnum Lentago.** (Sweet Viburnum. Sheepberry.)
32. **Viburnum pauciflorum.†** (Small flowered Viburnum.)
33. **Fraxinus Americana.** (White Ash)
34. **Fraxinus pubescens.** (Red Ash.)
35. **Fraxinus sambucifolia.** (Black Ash.)
36. **Dirca palustris.†** (Leatherwood. Moose-wood.)
37. **Shepherdia Canadensis.†** (Canadian Shepherdia.)
38. **Ulmus Americana.** (American or White Elm.)
39. **Juglans cinerea.** (Butternut. White Walnut)
40. **Myrica Gale.†** (Sweet Gale. Dutch Myrtle.)
41. **Myrica cerifera†** (Bay-berry. Wax Myrtle.)
42. **Myrica asplenifolia.†** (Sweet Fern)
43. **Betula leuta.** (Cherry Birch. Sweet or Black Birch.)
44. **Betula lutea.** (Yellow or Grey Birch.)
45. **Betula populifolia.** (Poplar-leaved Birch. White Birch.)

46. **Betula papyrifera.** (Paper or Canoe Birch.)
47. **Betula pumila.**† (Low Birch. Dwarf Birch.)
48. **Alnus viridis.**† (Green or Mountain Alder.)
49. **Alnus incana.*** (Speckled or Hoary Alder.)
51. **Corylus rostrata.**† (Hazel-Nut.)
52. **Ostrya Virginica.**† (Hop-hornbean. Leverwood.)
53. **Quercus rubra.** (Red Oak.)
54. **Quercus macrocarpa.** (Bur Oak.)
55. **Quercus coccinea.** (Scarlet Oak.)
56. **Fagus ferruginea.** (Beech.)
57. **Salix humilis.**† (Prairie Willow.)
58. **Salix discolor.*** (Glaucous or Bog Willow.)
59. **Salix petiolaris.*** (Petioled Willow.)
60. **Salix cordata.*** (Heart-leaved Willow.)
61. **Salix rostrata*** (Long-beaked Willow.)
62. **Salix lucida*** (Shining Willow.)
63. **Salix nigra.** (Black Willow.)
64. **Salix myrtilloides.**†
65. **Salix balsamifera.**†
66. **Populus tremuloides.** (American Aspen.)
66. **Populus grandidentata.** (Large-toothed Aspen.)
67. **Populus balsamifera.** (Balsam Poplar.)

CONIFERS.

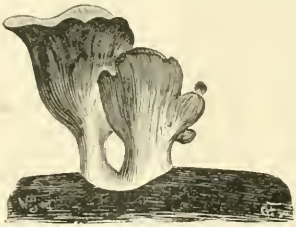
68. **Pinus Strobus.** (White Pine.)
69. **Pinus rigida.** (Pitch Pine.)
69. **Pinus Banksiana.** (Grey or Northern Scrub Pine.)
70. **Pinus resinosa.** (Red Pine).
71. **Picea nigra.** (Black Spruce.)
72. **Picea alba.** (White Spruce.)
73. **Tsuga Canadensis.** (Hemlock.)
74. **Abies balsamea.** (Fir. Balsam Fir.)
75. **Larix Americana.** (American or Black Larch. Tamarack. Hackmatack.)
76. **Thuja occidentalis.** (Arbor Vitæ. White Cedar.)
77. **Juniperus communis.** (Common Juniper.)
78. **Juniperus Sabina,** var, **procumbens**† (Shrubby Red Cedar.)
79. **Taxus Canadensis.**† (American Yew. Ground Hemlock.)

CULTIVATED TREES AND SHRUBS.

Tilia Europæa. (European Lime or Linden.)
Berberis vulgaris.† (Common Barberry.)
Robinia Pseudacacia. (Common Locust or False Acacia.)
Robinia viscosa. (Clammy Locust Tree.)
Rosa rubiginosa.† (Sweet Brier. Eglantine.)
Æsculus Hippocastanum. (Horse Chestnut.)
Crataegus Oxyacantha.† (English Hawthorn.)
Symphoricarpus racemosus.† (Snow-berry.)
Rhododendron Catawbiense. (Catawba Rhododendron.)
Quercus sessiliflora. (English Oak.)
Fraxinus Excelsior. (English Ash.)
Salix Viminalis.† (Osier or Basket Willow.)
Salix fragilis. (Crack Willow.)
Salix Babylonica. (Weeping Willow.)
Populus balsamifera var **candicans.** (Balm of Gilead.)
Populus dilatata. (Lombardy Poplar.)
Pinus Sylvestris. (Scotch Pine.)

Agaricus (Pleurotus) Coldwelli (?) (New Species.)

The whale's bone, figured more fully in the March number of the REVIEW, was picked up on the Yarmouth beach and sent to the museum of Acadia College, Wolfville, 8th September, 1889. It remained in Professor Coldwell's lecture room until May, 1890, when it was transferred to the museum. The fungus was first noticed in February, 1891, when it appeared as in our sketch growing from a little hollow on the upper side of the bone. Since then it appears to have grown a little more and to have changed its shape and resembles "an old fashioned three cornered hat with its edges considerably incurved." The height of the principal frond is about 2½ inches, and the breadth of pileus 3½ inches at present, March 31st. From the extreme firmness of its substance it might be considered a species of *Panus;* but in all other respects it appears to belong to the sub-genus *pleurotus.* Not being able to find a specific description of it among British or American *Agaracini,* we transmitted the portion of the specimen sent us to the leading American authority, Professor Peck, the State Botanist of New York. We give his letter below, and provisionally name the species after the Science Professor, Curator of the museum, who took the interest in the matter to bring it fully to our notice.



The Fungus.

STATE HALL, ALBANY, N. Y.,
March 19th 1891.

My Dear Mr. MacKay:—

The fungus specimen that grew on the bone of a whale reached me this morning. The habitat is certainly a curious one and one on which I should not expect such a fungus would grow. But these plants, like others, have the power to adapt themselves to some extent to circumstances. As to the species, the specimen does not agree rigidly with any description known to me, but is apparently closely allied to *Pleurotus pantoleucus,* Fr. and *P pometi,* Fr. Its spores are of the same size and characters as the spores of these species. But for its cæspitose habit and downy stem I should unhesitatingly refer it to *P. pantoleucus.* The downy stem may be accidental, for I find this same white down developed in patches on the pileus in such a way as to make me think it is not normal there at least. *P. pometi* has similar spores and a villose stem, and in one variety is cæspitose; but its stem is radicating and the pileus, more or less flaccid, so that I would sooner think your plant an unusual cæspitose form of *P. pantoleucus,* or possibly an undescribed species. If more plants develop, it might be well to note whether the velvety white down or tomentum is constant on the stem. The shape of the pileus in this specimen is strongly suggestive of the pileus of *P. pantoleucus*; but it is evidently modified by having grown in a clump, and the appearance in the figure is different; but the shape is also modified by place of growth, so that I cannot rely on this. Should other specimens develop, I would be glad to know of it, and especially if the downy stem and cæspitose habit should be modified. Very truly yours,

CHAS. H PECK.

BOOK Reviews, answers to questions and other matter, crowded out will appear next number.

Astronomical Notes.

The Planets in April.

The May moon will be eighteen hours old at sunset on the 8th. Then you may have a chance to see a moon on the very day of its birth.

As mentioned in last month's Notes, *Mercury* will be at his best as evening star during the first half of April. But there should be little difficulty in seeing him for some time after the middle of the month, say until about the 25th. His evening star season will end with his inferior conjunction on May 9. But instead of Mercury above or below the sun, as is his usual custom at inferior conjuction, he will this time pass right across the sun's face, and we shall have a *transit of Mercury*. This is a much more common occurrence than a transit of Venus, but it is a much less important one, and also a much less interesting one. The last four transits of Venus — 1762, 1769, 1874, 1882 — have been very important astronomical events, because of the attempts made to determine the sun's parallax by means of them. A transit of Mercury is of no use for this purpose. Then, in point of interest at a transit of Venus, the black back of the planet can be seen on the sun's face without any other instrument than a piece of smoked glass. Probably some of you saw it so on the afternoon of Wednesday Dec. 6, 1882. There won't be another opportunity until Tuesday June 8, 2004. Mercury is far too small to be so seen. The black spot that he will make on the sun on May 9 will be less than one-twenty-fifth of the size of the spot that Venus made in 1882. Small as this is, it will take five minutes to get the whole of itself on to the sun's face, and as much more to get off again. The whole transit will occupy five hours, but the show won't begin until after the sun sets here; so we shall see none of it. However, there will be another one on November 10, 1894. That one will be visible here, and as the day is a Saturday, we can look at it all that afternoon.

* * * * * *

Venus and *Jupiter* are morning stars, and just at present a sight of them is well worth the trouble of getting up a little earlier than usual. An hour, or even half an hour, before sunrise is early enough, and the earlier in the month the better. Venus is moving in towards the sun, Jupiter is moving out. They will pass each other on the 7th, and the morning of that day and of the next will be the best times to see them. On these mornings they will be only about half a degree apart — a moonbreadth. The distance between them will increase about a degree a day after this; on the 15th it will be seven degrees, at the end of the month twenty-five degrees. Neither of the planets is at its best — Venus has less than half her greatest brilliancy, and Jupiter has just about half of his—but, even so, they are the brightest objects in the heavens next after the sun and moon, and it is a very pretty sight to see them as close together as they will be during the first half of April. Which is Venus and which Jupiter you will probably be able to settle for yourselves. Try also to settle these things: (1) What is the color of each? (2) How many times as bright as the other is the brighter one? Put your answers — especially the answer to (2) — on a post card, and address as below.

Star-gazers who object to early rising may take a look at these planets during the forenoon, Venus with the eye and Jupiter with a opera-glass. In a clear sky Venus is not at all hard to find any time up to noon, just now; and when Jupiter is so near her as he is at present a good glass should pick him up without much trouble. As a general rule the best time for getting a daylight peep at them is when they are on or near the meridian. In the middle of April Jupiter will be on the meridian at 9 a. m. meantime, and about thirty-five degrees above the horizon in this latitude. At the end of the month the meridian passage will happen three-quarters of hour earlier, and the altitude will be a degree higher. From the middle to the end of the month Venus will pass the meridian about 9:40 a. m. at an altitude of from forty to forty-five degrees.

* * * * * *

Mars is very far from being the glorious object he was last year, but he is worth looking at just to mark the difference between his splendor then and his insignificance now. Then he was so big and bright that even Antares looked mean beside him. You can't compare him with Antares now, but there is Aldebaran, with about the same brillancy as Antares, and much the same color. Which is the brighter now, Aldebaran or that red dot to the right? That is Mars. He is moving up between the Hyades and the Pleiades; about the 25th he will be directly between Aldebaran and the Pleiades. Try in the early evening which of the two — Mars or Aldebaran — you can pick up first. At the end of the month your glass will show Mars passing very close to a couple of pretty pairs — the Kappas and Upsilons of Taurus.

In the the summer of 1892 Mars will be much brighter than he was even last year.

* * * * * *

Although Mercury, Mars, Neptune and Uranus are all evening stars in April, *Saturn* has the best claim to be called the evening star for the month. He is above the horizon the whole evening, from sunset to midnight, and he is one of the four or five brightest objects in sight. That's him, up there to the left of the Sickle — that yellowish star. No one near him as bright as he is — a steady old chap, too, scarce a twinkle to be got out of him. Those stars near him belong to the constellation Leo.

This is one of the very poorest years for seeing Saturn's Ring. It is closing up fast. The south side of it, which has been turned towards us for the last twelve years, will disappear at the end of September, and the north side will begin to come in sight at the end of October.

* * * * * *

Uranus can be easily found with an opera-glass between Spica and Kappa Virginis. Having found it, lay down your glass and try your eye. If you are not sure which of two objects in that space is the planet, watch them both from night to night until you see which one is the wanderer.

A. Cameron.

Yarmouth, N. S., March 25, 1891.

The *Normal Light* is the name of a neat and apparently well-conducted paper published by the students of the Normal School, Fredericton.

On the Early History of New Brunswick.

BY MOSES H. PERLEY.

A portion of a lecture delivered before the Mechanics' Institute, St. John, in 1841; now for the first time published.

(Continued from Mar. number.)

In 1772 all the country below the Oromocto, on the west side of the River, was burnt over, quite down to the Coast. This fire raged with great fury, in consequence of most of the forest trees having been blown down 14 years before in the great hurricane of 1758. The Nerepis Road still bears marks of this Fire, as does all the country to the westward of us between this and the Magaguadavic. On the 4th May 1770 Wm. Owen, Plato Denny and Wm. Sherwood were appointed the first Justices of the Peace in the County of Sunbury and the boundries of the County were then defined. The County began at the St. Croix, thence along the Bay of Fundy to 20 miles above Cape Mispec, and thence extending back due north, the same breadth, to the southern boundry of Canada. All the eastern part of this Province, at that time appears to have been considered part of the County of Cumberland in Nova Scotia.

Three years afterwards, in 1773, James White, James Simonds and Samuel Peabody were also appointed Justices of the Peace in the County of Sunbury.

At this time hostilities were going on between Great Britain and her revolted Colonies, now the United States, and the inhabitants in this quarter were much pressed, & solicited to join the confederacy. But they stood firm in their faith to the British flag, and thereby incurred the displeasure of their western neighbours.*

In August, 1775, the rebels from Machias landed at this place, burned the fort & Barracks at Fort Frederick; and captured a brig laden with oxen and sheep for the British Army then at Boston.

The following year the Vulture, Sloop of war, was stationed in this Bay, between Annapolis and St. John, for the protection of both places; but one Sloop of war was not sufficient, for the rebels, visited and plundered the Inhabitants several times in that year. In consequence of disturbances in Cumberland 50 men were sent from Halifax to keep order in that district. In Novr. a number of disaffected persons, with a number of rebels from New England, appeared before the Fort at Cumberland; they failed in their attempt upon it, and then made their way across to the Gulf Shore. Arriving suddenly at Pictou, they seized a valuable armed merchant ship, which was loading for Scotland, & with her, they made preparations for plundering St. John's Island.* Lieut. Keppel was sent in persuit of them—he recaptured the vessed and carried her into Charlotte Town.

On the 4th July 1776, the day on which the Americans declared their independence, Mr. Michael Franklin, the agent for Indian affairs, concluded a treaty of peace with the Indians on this River, and induced them to deliver up to him an agreement they had entered into with an agent of the rebels, to furnish them with 600 fighting men. For some time after, however, the Indians were kept in a state of ferment, by emmisaries from the rebels, who were sent among them, to endeavor to excite hostilities agt the English. The Settlers were in a state of constant alarm and uneasiness. Mr. White was appointed the Deputy of Mr. Franklin the Indian Agent, in this quarter—and to his exertions, and the great popularity he enjoyed among the Indians, may be attributed the preservation of peace with them. They called him familiarly "*Wabeet*," and he felt such confidence in their good feeling towards him, that he would at any time, venture alone among them; and he invariably succeeded in appeasing them, and preventing any outbreak.

In 1777 a rebel privateer visited this harbor and plundered the Inhabitants of every thing of value. From Mr. White's store alone, they carried off 21 boat loads of British merchandize. When these predatory visits, the inhabitants fled to the woods, where they remained until the plunderers departed. This last visit almost beggared them, and then, upon their urgent representation, a party of soldiers was sent from Halifax, in a transport, Dec. 1777. They were convoyed by a Sloop of war (which remained in the Harbour until the following spring) and they brought with them a Block House, ready to be put up. This they erected on the top of the high hill in Portland, which they named Fort Howe,—& thereafter a garrison was always kept there. In 1778, the Indians were incited by a Colonel Allen, who resided among and had great influence over the Penobscot Indians to make an attack upon the Settlers on this harbour

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*It is well known that in 1776, a month prior to the Declaration of Independence, the Maugerville Settlers, at a public meeting, declared themselves in sympathy with the revolted colonists. This has been made a reproach to these people, but unjustly It must be remembered that the hardships and many sore trials of their thirteen years separation from their old homes and friends in New England, would rather strengthen than weaken their best sentiments towards the one, and their sympathy for the wrongs of the other. We should rather regret than condemn their action. Afterwards they became loyal enough to Britain.

This is the place to say that some of the descendents of Israel Perley, and perhaps others, have been told by the old people and believe, that this action of the settlers in 1776 was not inspired by hostility to Great Britain, but was primarily an act of policy, to secure for their defenseless homes security from the attacks of the Indians, whom they well knew the colonies would endeavor to incite against everybody and every thing British. That such an effort was made is shown a little farther on in this lecture. *W. F. G.*

*[i. e. Prince Edward Island.]

& also upon Fort Howe. A party of the Penobscots came thro' under their chief Au-wah-wes to join the Milicetes under Pierre Thoma, in the proposed attack.

A very strong force was thus assembled, at *Ock-pa-haag*, four miles above Fredn. where there was an Indian village*—(*Ock-pa-haag* signifies "the beginning of the swift water"—the early settlers generally pronounced it *Oak Park.*) This force proceed down the river in ninety canoes. Mr. White hearing of their coming, set off, in a four oared barge, unarmed, to meet them. He found them halted at the head of the Reach, opposite Wordens, and there held a long conference with the Chiefs.

Pierre Thoma, who had the Chief command was inclined to listen to *Wabeit*, but the other Chiefs were not. At length "the talk" was broken up, by *Thoma* saying that before giving a final answer he would consult his God—He then retired apart from the rest, and threw himself flat upon his face, on the soft sand beach of the river. He there lay motionless nearly an hour; then rising, he again assembled the chiefs around the Council Fire. Then he informed that he had consulted his God, who had told him, that he had always recd. good treatment from King George's men; that King George had never injured him, but had given him many presents. That he knew nothing of Washington or his men, and he had determined to keep peace with King George & his people, and should return with his followers to *Ock-pa-haag*. This gave great dissatisfaction to the Penobscots, but they were forced to give in & *Au-wah-wes* & his party accompanied Mr. White to St. John, while Tomah returned to the village. This was a bold stroke of policy, and Mr. White ran a risk which few men would willingly have encountered. His exertions on this occasion were so effectual, that there was never afterwards even a threat of hostilities from the Indians, and all has remained in quiet ever since.

In 1779 Mr. White, by order of Govt. erected a building at Indian Town for the accomodation of the Indians when they came to trade.

And now Ladies and Gentlemen we come to a point of great interest in our history.

On the 16th December 1782, the governor of Nova Scotia received a letter from General Carleton, dated at New York, stating that many families, determined on maintaining their allegiance to the British Crown, would come to Nova Scotia, and settle on the ungranted lands, within its extensive limits. "If the revolted Colonists were proud of their declaration of independence, well may the loyal Refugees exult with honest becoming pride in their Declaration of fidelity, fidelity proved to the uttermost."

The praises of their unflinching loyalty & devoted patriotism should sound in their aged ears, whilst yet they can hear, from the mouths of their sons & daughters; those praises should be reiterated & perpetuated at our public festivals & anniversaries as the noblest epitaphs which can hallow the acts & principles of the worthy dead, and do honor to the cause for which they endured and suffered—for which they bled and fell—that of their Sovereign and their country. In May 1783 the first fleet, with a large number of these brave spirits, who had abandoned all to maintain their loyalty, arrived in this Harbour. The point of land on which this City stands had been previously laid out in Town lots, by Paul Bedell (the Father of J. L. Bedell Esq) and had been named *Parr Town*, after Gov. Parr of Nova Scotia.

(To be continued.)

Euclid. Book II.

I.

(Continued.)

SUMMARY OF EUCLID II., 1 TO 10.

1. Let a, b, c be segments of a line and x another line. Then

$$(a+b+c)x=ax+bx+cx.$$

(To be proven geometrically by the diagrammatic method as in Euclid—the only case in which this method is necessary).

2. Let a and b be the segments of a line.

Then $(a+b)^2=(a+b)(a+b.$ (Def. of Sq.)
$=(a+b)a+(a+b)b.$ (Euc. II, 1.)
Q. E. D.

3. Let a and b be the segments of a line.

Then $(a+b)a=aa+ab.$ (Euc. II, 1.)
$=a^2+ab.$ (Def. of Sq.)
Q. E. D.

4. Let a and b be the segments of a line.

Then $(a+b)^2=(a+b)a+(a+b)b.$ (Euc. II, 2.)
$=a^2+ab+ab+b^2.$ (Euc. II, 3.)
$=a^2+b^2+2\,ab.$ (Ax.)
Q. E. D.

5 and 6. Let x be the mean distance of the point of unequal section of a line, and a be the half of the line.

Then $(a+x)$ and $(a-x)$ are the two segments.
And $(a+x)(a-x)=(a+x)a-(a+x)x.$ (Euc. II, 1.)
$=a^2+ax-ax+x^2.$ (Euc. II, 3.)
$=a^2-x^2.$ (Ax.)

[$(a-x)$=difference between a and x—the greater to be taken from the less.]

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* At Spring Hill.

7. Let a be a line, b one segment, then a—b will be the other segment.

Then

$$\begin{aligned} \underline{a}^2+b^2 &= \overline{(a-b)^2+\underline{2\,b\,(a-b)}+b^2}+b^2. && \text{(Euc. II, 4.)} \\ &= (a-b)^2+2\,ab\underline{-2\,b^2+b^2+b^2}. && \text{(Euc. II, 1.)} \\ &= (a-b)^2+2\,ab. && \text{(Ax.)} \end{aligned}$$

Q. E. D.

Cor. $a^2+b^2-2ab=(a-b)^2$. (Ax.—equal parts taken from equals.)

8. Let a and b be the segments of a line, then (a—b) will be their difference.

$$\begin{aligned} \text{Then } (a+b)^2 &= \underline{a^2+b^2}+2\,ab. && \text{(Euc. II, 4.)} \\ &= \overline{(a-b)^2+2\,ab}+2\,ab. && \text{(Euc. II, 7.)} \\ &= (a-b)^2+4\,ab. && \text{(Ax.)} \end{aligned}$$

Q. E. D.

9 and 10. Same hypothesis as in 5 and 6.

Then

$$\begin{aligned} (a+x)^2+(a-x)^2 &= \begin{cases} a^2+x^2+ax. & \text{(Euc. II, 4.)} \\ a^2+x^2-ax. & \text{(Euc. II, 7. Cor.)} \end{cases} \\ &= 2\,a^2+2\,x^2. && \text{(Ax.)} \end{aligned}$$

Q. E. D.

Note.—By the algebraic transposition of the terms of the equation, which constitutes the proposition forms called corollaries are obtained, algebraic transposition is the short method of applying one or other or both of the two axioms. "If equals be added to equals the wholes are equal, and if equals be taken from equals the remainders are equal."

Nature's Temple.

Talk not of temples—there is one built without hands to mankind given;
Its lamps are the meridian sun and all the stars of heaven,
Its walls are the cerulean sky, its floors the earth, serene and fair,
The dome is vast immensity—all Nature worships there.

The Alps arrayed in stainless snow, the Andean ranges yet untrod,
At sunrise and at sunset glow like altar fires to God.
A thousand fierce volcanoes blaze as if with hallowed victims rare;
And thunder lifts its voice in praise—all Nature worships there.

The cedar and the mountain pine, the willow on the fountains brim,
The tulip and the eglantine, in reverence bend to Him;
The song-birds pour their sweetest lays, from tower and tree and middle air,
The rushing river murmurs praise—all Nature worships there.

—*Arbor Day Manual.*

That compulsory education in Illinois is a success is attested by the fact that ten thousand children were taken from the streets of Chicago and placed in the schools.

For the Review.]

Trees in School Grounds.

There are two school-houses not far apart in a little town in Maine. One is a fine structure, built upon a low hill, with its outlines rising stiff against the sky; the other, now old, and never handsome, is surrounded and almost hidden from the road by a thick growth of white spruce. Glimpses of children playing about the door leave little question as to which of the two is furnishing the men and women of the future with the pleasantest memories of school days. In the one case, beauty had been sought, at very considerable expense, in the way of architectural display; in the other, beauty had been secured, whether intentionally or not, by building the house among the trees.

The absence of trees is a defect which is easily remedied, and their presence will do much to make the meanest school-house attractive and picturesque. Where well grown trees have been left standing in the school ground, it should be a part of the work of Arbor Day to give them any care and protection they may need. A fine old white pine, or a handsome yellow birch, where such a thing exists, should be regarded as the chief ornament of the place. Every effort should be made to bring out all its beauties, and nothing done that will tend to lessen its effect.

But often the only thing done for the school ground has been to "clear it up" by cutting away everything that grew. In such cases it will be necessary to begin anew.

When the planting is only for ornament, the choice of trees of the same sort, or at least of similar growth, is preferable to a great variety, especially if but little space can be allotted to them. Those who distrust their own taste and judgment in the arrangement can find useful hints on page 54 of the Manual of School Law. With the instructions there given, there is not much danger of going astray. In general, short lived trees are to be avoided, and only those planted that with proper care will be sure to live and grow. The original forest, if some portions of it remain in the vicinity, will be the most trustworthy guide in this matter. Making due allowance for difference of soil and situation, the trees there found may be planted with some certainty of success.

Elms and maples appear to be the favorite trees in New Brunswick, and there are few school sites in the province where one or other of them would not seem in place. Grown as a single tree, on flat alluvial soil, the elm is without a rival. No lesser trees or shrubs should be allowed near it. The bole must rise clear from the grass, as much of the beauty of this tree is found in its straight, symmetrical shaft. An avenue of stately elms is grand, especially if it be very long and very straight; but maples are more suitable for the modest pathway that leads to a village school. Whether in clumps, in rows, or as single trees, the maples are beautiful; and equally so on rounded hill tops, on gentle slopes, or on the level ground. They are easily transplanted, they grow quickly, and the grass will flourish under their shade. The red maple, prized for its rich coloring, both in spring and fall, will succeed in any soil that is neither very wet or very dry; the rock maple, scarcely inferior in form and color, likes the dry and shallow soil of the hillside; while the silver maple, the most graceful of the three, prefers the rich flat land of river bottoms.

The beech is seldom seen transplanted; perhaps because it is so hard to manage. It is certainly not lacking in beauty. White, of Selborne, speaks of it as the most lovely of all forest trees. And who does not know the delights of a beech grove in early spring, with the fresh odor of the bursting buds, or in autumn days, when the warm sunshine pours through the transparent yellow of the leaves and makes a richer sunlight in its shade. No grass grows under a beech tree. For this reason, and because it needs no great depth of soil, the beach is best adapted for planting in rocky places where few other trees would thrive.

In damp, rich soils, either the black or the white ash will make a handsome tree. Their chief fault is that they are slow to put forth their leaves in the spring and lose them early in autumn; but their rapid growth, and the rich, dark green of their foliage, are strong points in their favor.

Some of the birches do well in a shallow soil; though the most desirable of them, the yellow birch and the black or cherry birch, need a deep, cool soil for their best development. The black birch grows very fast, and is particulary noted for the beauty of its leaves. The yellow birch throws out its branches regularly, forming a magnificent head, and, like the oak or the butternut, should be grown singly and where it will have plenty of space.

Most of our native conifers can be used to advantage in some places. The white spruce and cedar are best for hedges and screens. A young fir is pretty when standing alone, in the form of a slender cone, with its lower branches resting on the ground. The pines are very desirable, but rather difficult to grow. The hacmatac has received more favor than its straggling growth and scanty foliage would seem to merit; and now that it is attacked by the larvæ of the larch saw-fly, it must cease to be regarded as an ornamental tree.

Among introduced trees, the lime, the horse chestnut, the English ash, the locust and the laburnum are valuable as single specimens. The poplars generally are rapid growers, but do not live long. The Balm of Gilead and the English white poplar throw up suckers from the root. The same objection applies to the clammy locust, and to such shrubs as barberry, spiræa and the hardy roses.

There is one thing which needs to be insisted upon, even at the risk of seeming to overstate it. Next to the cutting away of trees, the worst vandalism is what is called trimming them up. Regarded as an object of ornament in the landscape, the main point of beauty in a tree is at its base. In a thick forest growth, the lower branches perish from natural causes, but it does not follow that a naked trunk and spreading top is the perfect form of a tree. And, if it were, the eye demands not that the tree should be perfect in itself, though that is always desirable, but that it should add an element of beauty to the place in which it stands. The ardent lover of trees will watch their growing tops, observe their changing greens in light and shade, and admire their graceful forms against the sky. So seen they have a beauty all their own. Yet they are not, like the clouds, a separate picture, but belong to the ground and must be connected with it. Where trees surround an open space, or where the edge of the forest comes up to the school grounds, encourage the growth of shrubs, and under shrubs to form from grass to tree tops a solid wall of green. Without much encroaching upon the open space, this connecting strip of leafage between grass and trees may be made a feature of special interest. It would be a suitable place for all the spring and summer flowering shrubs, from the May-pear to the meadow-sweet, to be followed by the tallest of the golden rods and the best of the native asters, so that every week from May to September will furnish something new. The only care needed would be to keep out unsightly and weedy plants, and to see that the stronger trees and bushes did not crowd out the others, or spread beyond their bounds. It is best, of course, to select shrubs that do not "run" and are easily kept in shape. Such are the lilacs and syringas, among hardy cultivated shrubs, with thorns and shadbush and wild cherries from the woods, and the viburnums, witch-hazel and mountain ash.

If there is a fence between the school ground and the road, make the best of it. It must not, of course, be a shelter for thistles and other noxious weeds. Whether it be a rough stone wall, a pole fence, or something more artificial and more expensive, the best way to treat it is to cover it up with green. Shrubbery may be set on both sides of the fence, giving the preference to native shrubs, but avoiding such as the alder and the elder, which are subject to the attacks of insects. Unless there is a public spirit which can be trusted, it is wise also to reject those which, like the May-pear and wild cherry, are likely to be broken for their flowers or their fruit. Low shrubs are the best, in most situations, so that the grounds and buildings may not be hidden from the road; but let it be shrubs of low growth and not those kept low by cutting back.

If on wet or clayey soil, the ground-nut, wild clematis and wild convolvulus may be planted, to cover fence and hedge-row with their drapery. In a drier situation, settings of Virginia creeper can be used. The Virginia creeper is a rapid grower, and is often used alone for covering a fence. It may be clipped like a hedge, where a straight line effect is required; but this can only be where there is an imposing building with terraced grounds and straight bordered walks, and even then the question is one which must be left to the architect, for possibly the wayward growth of the creeper may be just what is needed to connect the symmetry within the enclosure and the irregularity without.

In conclusion, then, the architecture of a grand edifice may require a formal treatment of the surroundings; but, with this limitation, it may be laid down as a canon of taste that we should never clip or mutilate a tree, either at top or bottom, nor try to confine a growing plant within unnatural lines; and nowhere can this general rule have greater force than in school grounds. There, for educational reasons, the most appropriate ornaments are indigenous trees and plants in their natural forms; for the love of nature is the best introduction to the love of art.

J. VROOM.

St. Stephen, N. B.

WHAT IS OUR DUTY.

"What is our duty here? To tend
From good to better — thence to best;
Grateful to drink life's cup — then bend
Unmurmuring to our bed of rest;
To pluck the flowers that round us blow,
Scattering our fragrance as we go.

And so to live that when the sun
Of our existence sinks in night,
Memorials sweet of mercies done
May shrine our names in memories' light,
And the blest seeds we scattered bloom
An hundred fold in days to come."

— *Arbor Day Manual.*

For the REVIEW.]

Our Native and Our City Trees—How we May all Know Them.*

Of all plants, trees are the most conspicuous, on account of their size and beauty. Every one of us has an instinctive, if not a nurtured, love for them. We seek their cooling summer shade, and their shelter from the stormy blast; even our domestic herds and flocks, and the wild animals do the same. With pleasure we reach up to the ripening fruit which those that we call fruit trees offer. People, even the most incurious, who have not been trained to observe the operations of nature, cannot help noticing, with some measure of delight, the budding forth of the trees in springtime; the profusion of blossoms with which they lighten up the early summer woods; the fresh livery of green, in many shades, that they put on when the fine weather comes; the gay colors which they flaunt to the autumn breeze in the bright sunshine of the declining days. And if any there be who are callous to all this beneficent beauty, even such can appreciate the luscious fruits, whose plump cheeks and glowing hues seem to bathe the trees in grateful wreathed smiles, as they bring their last tribute of the year to the honest husbandman. He has planted, and fed, and watered, and pruned, and defended them, as if they were flesh and blood children of his own. Let no boy be so ignorant as to imagine that if he assaults an apple tree, held so dear, he will meet with mercy from its owner.

The number of *different kinds* of trees in a temperate country like ours is not great. Compared with the grasses, or the rushes and sedges, or the daisy-flowered plants, the species of trees are really comparatively few, and, then, the differences we see in trees are usually well marked, needing no magnifier; for the trees belong to widely different natural orders, or what we may call, in accordance with the language of our time, evolutional categories. For these reasons any pupil of a school can soon be taught to know all the important TREES of his or her native Province.

The trees may be set apart into two distinct armies that have very little in common, except that they are trees:

1st. The broad-leaved trees, whose leaves have a conspicuous mid-rib, with side veins proceeding from it at nearly regular intervals of space, and a network between; (all this may be clearly seen by holding up the leaf between the eye and the light.)

2nd. The needle-leaved trees, whose leaves are long, slender, more like prickles than leaves, with no room for veins.

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* Written for persons whose minds have not been disturbed by botanical terms. In case some scientific student may venture to read this silval breviate, I apologize to *him* in advance for the liberties taken with Her Majesty's English as she is printed in "the botanies."—G. L.

The broad-leaved trees vary in their flowers and fruit, in the different species that are not related to each other, but these parts are not always accessible. The leaves we can always examine; even in winter, if the snow is not too deep, we can find the fallen ones in the hollows. The elm of interval lands is a noble tree, with a tall naked stem, which branches out at top into a gigantic plume. Its leaves are arranged in an alternate manner along the shoot; each has a mid-rib and closely-set, straight, parallel side veins, which end at the margin in angular teeth like those of a saw. Instead a succulent fruit or a nut, the elm produces something like a tiny, flat, oval-shaped paper bag, with a thicker kernel in the centre.

The beech has leaves with a mid-rib and straight side veins somewhat like those of the elm, but they have a smooth appearance; the fruit is very different, consisting of triangular nuts, usually two together in a small pouch or case, rough outside, which opens at top as the nuts ripen by the spreading apart of four lips.

The aspen is known by the long, slender leaf stalks, which are flattened in a way not seen in any other tree, so that the leaves are constantly trembling. One species, closely related to it, has much larger leaves, which are covered *when young* with dense white wool, making the foliage of the woods look pale in spring-time. It is called popple in Nova Scotia. The Lombardy poplar, a tall, very slender tree, like a leafy-post, was planted by the early French settlers in many places. The balsam poplar is known by its very large leaves, and its habit of running shoots under ground, from which new trees grow up.

The oak is known by its leaf appearing to be divided or cut into a few large lobes, each with a vein in its centre proceeding from the mid-rib, and the fruit is in form of a smooth, shining nut sitting in a rough cup; such a fruit is called an acorn.

The birch has smaller and thinner, papery leaves, with sterile flowers in long, slender pendents, which appear in early spring and soon drop off. There are other spikes much shorter, which remain and contain the seeds. There are several species of birch which differ in the size and shape of the leaves, whether rounded or angular, and the color of the bark. The sweet, or black birch, has dark-brown bark and straight veined leaves; the yellow birch also has straight veined leaves, but its bark is yellow. In the American white birch (as it is called), the leaves are somewhat triangular, and taper-pointed, trembling on their slender stalks, the bark chalky white and separable into thin sheets like paper. This last character is more fully seen in the true paper or canoe birch, which has egg-shaped, not triangular, pointed leaves.

The ash trees have what are called pinnate leaves; that is, the leaf consists, not of one piece, but of a number of blades (each with a very short stalk) arranged feather-like along a stalk which terminates in a similar blade or leaflet. These pinnate leaves come out two together from the shoot on opposite sides, where there is usually a swelling of the shoot, and a bud for each leaf. The fruit is dry and husky, hanging in little clusters or tassels, each fading away into a thin papery membrane. The white ash has bare leaf-stalks, and the leaflets are pale beneath. In the red ash they are hairy or velvety; the green ash has them bare, but the leaves are green on both surfaces. The black ash is known from all the rest by having no stalks to its leaflets. In this it resembles the European ash, which is grown as a shade tree in cities; its leaflets do not have the long, slender tips of the black ash.

The European lime is the best shade tree in the city of Halifax; it has egg-shaped pointed leaves, but one side of the leaf at the stalk end is larger than the other,—the leaf is lop-sided. The stalks that bear the clusters of odorous flowers and small fruit balls, hang from the middle of odd-looking, flat, straw-colored strips of tape or ribbon or bass-mat material that do not look like stalks or leaves or flowers or any thing else that one looks for in a tree.

The horse chestnut is also a foreign tree, and may be known by its nuts, or by the leaves, which consist of a number of very large leaflets spread out from the top of the stalk as fingers from a hand.

There are a number of native trees that do not grow to any great size. The mountain ash (often called stinking ash, from the smell of its broken shoots) has *compound* leaves, that is, leaves consisting of a great number of small blades arranged on two sides of a stalk as in the ash; this is why it is called ash, which is a misnomer. It has showy *flat* clusters of white flowers, which are succeeded by bright red berries, bigger and harder than currants.

The hawthorn is a small branchy, thorny tree, with lobed leaves, white blossoms, and clustered fruits that look like berries but are soft only outside, with hard stones within.

The Indian pear, shad bush, or amelanchier, has ovate or oblong simple leaves, sharply serrated, and racemes of white flowers, with long narrow petals. Boys eat the small sweet fruit.

Our native willows are shrubs rather than trees. The leaves are long and narrow, tapering with short stalks or sessile. The sterile spikelets are borne on one bush or tree and drop off early; the fertile catkins on other. The white willow, which grows to the size of an immense tree, has similar long, narrow leaves, and the sterile tree is known from the fertile one by the early dopping of the tender spikelets, that then lie in the grass like hairy caterpillars. This tree was planted extensively by the early settlers from Europe.

The needle-leaved trees usually bear cones as their peculiar form of fruit; the scales of these open and allow the seeds to fall out.

The white pine is the most valuable of all American trees for its lumber. The needle-leaves are clustered *five* in a sheath.

The pitch pine has only *three* leaves in a sheath, and are from three to five inches long.

The scrub pine has its leaves in *twos*, but only one inch long. The red pine also has its leaves in *twos*, but they are *five* or *six* inches long.

The spruces have their leaves singly all around the branch or shoot, and the cones hang down. There are three kinds, the black, white and red spruce.

The hemlock leaves are short, and look as if arranged along two sides of the shoot, making a flat frond. The cones are very small with thin scales. The long, slender tips of the young branches always hang down gracefully, instead of standing up erect, or straight out, like those of a spruce.

The balsam fir has much larger, flat needles, arranged as in the hemlock, so that the shoots are like nothing more than a double-toothed comb. The cones are long, cylindrical, and stand *erect* on the branches like candles, the balsam running down their sides, and when the cone ripens, its scales fall off, leaving a bare, straight, erect peg like a short wire, or as if the candle-wick remained. GEORGE LAWSON.

Halifax, 20th March, 1891.

For the REVIEW]

The Physiology of a Tree.

The higher plants and the higher animals are so manifestly and strikingly unlike each other in externals, that to those who look no deeper, they seem to have but little in common. Yet under all their elaborate diversity they have this fundamental and all-important connection, that both live. Both therefore must obey all the laws which control living matter; and these laws are the same for both. Hence it is that plants have a "Physiology"; and like animals, including ourselves, Trees must eat, drink, digest, breathe, grow and reproduce, and they must have organs to carry on these functions. It is our present purpose briefly to examine both organs and their functions.

THE PHYSIOLOGICAL ORGANS OF A TREE. Nearly everybody knows that all vegetable structures are made up entirely of *cells*. A typical plant cell is in size too minute to be seen by the naked eye; in form, it is a sphere bounded by a thin transparent elastic wall. Just inside of this wall comes a lining of the living matter, Protoplasm, a jelly-like substance in which reside all the vital properties and powers of the plant. And filling the remainder of the hollow of the sphere are various contents, as sap, sugar, starch, crystals, etc. These are the simplest cells; but in order to perform special duties, they may become altered greatly in size, shape, thickness and composition of the walls, nature of the contents, etc.; but out of them, however modified, the entire tree is built up.

An attempt to classify the varieties of cells soon shows that they fall naturally into three systems, each of which has its own particular work to do. These are

(1) *The Epidermal system*, which consists of a thin tough sheet of flat transparent cells, thoroughly waterproofed by the presence in their walls of the same substance which makes ordinary cork waterproof. The cells may grow out into hairs or scales wherever the plant has use for such structures. The epidermis forms a complete coating over all parts of the plant, perfect except that its waterproofing diminishes on the youngest roots, and unbroken except for tiny openings in the green parts, (called stomata) guarded by special cells having the power to close them. In old trees, the epidermis on the stem is replaced by the tougher corky bark, which even better serves the same purposes. The use of this system is to prevent the evaporation of the precious water, and to protect all the interior tissues.

(2) *The Fibro-vascular system*, consists of long tough fibres, each a cell, for strengthening and supporting the tree-structure, and of water-passages or ducts, made by the removal of the contact-walls of long chains of cells, for conveying liquids. These mingled together form all the mass of the wood of the tree, the fibrous part of the inner bark, and extend out into the leaves as the veins. The cells in it are variously thickened and stiffened to make the whole structure firm.

(3) *The Parenchyma system*, is made up of cells little altered from the typical simple form described above. It includes the pith, the green part of the bark, the cambium or growing-layer, the medullary rays or "silver-grain," all young growing roots and buds and all the green parts of young stems and leaves. Its uses are varied, as will presently be seen.

It will greatly assist our readers in understanding what follows, if they will try to form a vivid mental picture of the tree as made up of these tissues as we have described them. It is to be noticed that in the plant there are far fewer forms of "tissues," fewer distinct physiological organs, than in the animal. This is because specialization or division of labor in plants is much less perfect than in animals; and one structure has to perform several duties.

How and what the Tree eats and drinks. Botanists and chemists have joined forces for this study, and they have found that the tree, like all other plants, uses as its food these four substances, carbonic acid gas, water, nitrogen and some common mineral salts. Out of these, and these only, does the tree build up not only its own structure, but also all of the immense variety of products which it yields us.

The carbonic acid gas (CO_2 of the chemists) exists in a very dilute form, about one twenty-fifth of one per cent, in the atmosphere. From this it is taken into the digestive organs, i. e. the leaves, of a Tree directly through the epidermis, which is so constituted as to stop the passage of water vapor, while allowing other gases to pass freely. The water (H_2O) on the other hand, is taken in entirely from the soil through the tiny hair-like outgrowths of the epidermis of very young roots. These hairs can extract, by the physical process of osmosis, even the smallest quantities of moisture from the soil. The water is then conveyed up to the leaves as "sap," through the younger wood, the force which raises it being a combination of capillarity and a certain little-understood property of the living-matter, or protoplasm, contained in the medullary rays or "silver-grain."

Nitrogen (N) is of very great importance to the tree, as it is an essential constituent of the protoplasm. It is nearly all obtained from the soil in some soluble compound dissolved in the water taken up by the roots, and with the water it is taken to the leaves. It gets into the soil in three ways; either from the decomposition of animal or vegetable matter containing it; or from rain-water in which it falls dissolved in the form of nitrous acid formed in the air by electrical action; and lastly from nitrates formed in the soil by the agency of Bacteria or germs.

The mineral salts are without exception taken in with the water in solution through the roots and with the water carried to the leaves. To effect the solution of mineral salts, an acid is formed by the young roots.

How the Tree digests or assimilates these substances. The leaf is the digestive organ of the tree, and the raw food substances being within it, digestion will begin provided there is green matter present and sunlight or its equivalent,—but these two latter conditions are absolutely requisite. The green matter, or chlorophyll, occurs in the protoplasm of the leaf-cells in the form of granules, but nothing whatever is known as to the cause of its peculiar properties. We simply know that without it, assimilation and therefore vegetable and animal life would be impossible. This is perhaps a new view to many of our readers as to the use of the green color of vegetation.

The process of digestion consists primarily in the decomposition of the CO_2 and H_2O, and the formation from their elements of a new substance. That substance is first recognizable as *starch*, ordinary laundry starch. In this process, all the carbon and hydrogen are needed to form the starch, but there is a large quantity of oxygen left over, which is given out again by the plant. The process may be illustrated simply by the following formula which our chemical and perhaps all our readers will understand.

$$6\,(CO_2) + 5\,(H_2O) = C_6H_{10}O_5 + 6\,(O_2).$$

In other words, by the decomposition of six molecules of carbonic acid gas and five of water, there are produced one molecule of starch and six of free oxygen. It is thus that plants purify the air for animals, absorbing the carbonic acid gas, retaining carbon and giving back to the air the pure oxygen.

The atoms of the molecules CO_2 have an exceedingly strong affinity for each other, so much so that a tremendous force is required to pull them apart. That force is supplied by the energy of the sun's rays, which explains the need for sunlight in the process of assimilation. But though forced apart, the atoms still retain their affinity, the carbon of the starch and the oxygen of the air, and they will eagerly re-unite if allowed to do so.

But what of the nitrogen in this process? It takes no part in the formation of starch, but this once formed, a union of some of its constituents with the nitrogen gives us the albuminoid or protoplasmic substances which are of such vital importance. This union for the most part takes place in the stem away from the leaves. All food substances whatever, formed by the tree, pass through stage equivalent to this, that is, they are formed from the starch.

The mineral salts are of subordinate importance.

How the Tree stores up food. It is evident on a moment's thought, that if plants produced only so much starch as they individually need, there would be none for animals, and animal life would be impossible. Plants do more; they store up materials to give them a start in the spring, and to give their seeds a start in life. It is of this store that animals rob them. The insoluble starch formed in the leaves wood, bark, buds, or roots, after being re-converted is converted into soluble sugar and carried back in solution into the stem, where it is stored in the pith, into insoluble starch. Nitrogenous substances are stored in a similar way. The need of withdrawing them from the leaves is evident; were it not done they would be lost when the leaves fall.

HOW THE TREE GROWS AND BREATHES. The material for new growth used by the tree, is some of the very starch and protoplasm which it has formed by assimiliation. These are made soluble, transferred to where there are needed and there employed to build up new cells — for all growth is but the formation of new cells. But in addition to food, there is needed in all growth a certain amount of energy or force. Growth is a form of work, and just as certainly requires force to accomplish it as does the lifting of a weight by a man. The source of this force is the energy which is set free when the oxygen of the air is allowed to combine with the carbon of the starch. We have already noticed the very strong affinity of these elements for each other, and that a great force is required to tear them apart. When they are allowed to re-unite, they will give out an amount of force equivalent to that which was required to separate them. The process may be compared with what takes place in a storage-battery, in which a current of electricity tears apart certain atoms which have a strong affinity; as long as these are kept apart, no force is exerted — it is stored. When they are allowed to re-unite there is given out again a current of electricity, which, as everybody knows, can do work. The same thing is shown when the oxygen and hydrogen of water are forced apart; when allowed to re-unite, as they do in the oxy-hydrogen blow-pipe, great heat, a form of force, is given out. And again, when we allow the carbon of coal to re-unite with the oxygen from which it was separated by the power of the sun's rays long ages ago, heat is given out which we can utilize in various ways. The oxidation of starchy materials, therefore, is the source of the energy required by the plant for its growth; and precisely the same thing is the case with animals. Both absorb oxygen and both give off oxidized carbon or carbonic acid gas — in other words, both breathe.

At first sight it appears that this process is not consistent with what we said of assimiliation,— the latter requiring the absorption of CO_2 and elimination of oxygen. But both processes do occur in every plant. Growth and respiration, however, are most active at night or in darkness (whence the unhealthiness of plants in sleeping-rooms), while assimiliation can only occur in sunlight. And, moreover, in the latter process far more CO_2 is absorbed and O given off, than are given off and absorbed respectively by the former. Hence plants *do* purify the air for animals. Where both processes are going on together they doubtless use, to a certain extent, each other's products.

HOW THE TREE TRANSPIRES. This process has no counterpart in the animal world. It consists in the giving off of pure water from the leaves, carefully regulated by the cells which have the power of opening and closing the stomata or (improperly called) breathing-pores. Its purpose is to concentrate and make more available, the very dilute nitrogenous and mineral substances taken in by the roots. The amount of water thus transpired is often very great—so great in some trees (as the Australian Eucalyptus) as to make them good drainers of marshy soils.

HOW THE TREE GETS RID OF WASTE MATTERS. These are of three sorts — gases, liquids and solids. Of the gases, oxygen is a waste product in assimiliation and carbonic acid gas in respiration; these are given off directly through the epidermis. Of liquids, water is a waste product in transpiration; it is given off as vapor through ths stomata. Of the solids, nearly all are crystalline; some are useless matters taken in with water through the roots with needed substances, and some are secondary products of needed chemical changes within the plant. These are either stored up as crystals in little-used cells of the stem, when the trees cannot really get rid of them of course, or else they are carried to the leaves, which drop in the fall and thus remove them from the plant. Probably this is one reason why the leaves of our trees periodically are shed All useful matters are, however, withdrawn into the stem from the leaf before it falls.

HOW THE TREE HEALS INJURIES. When the tree is injured from without, a host of moulds, germs and other organisms are ready to attack it through its wounds. As a protection against this invasion most trees, especially those with brittle wood, secrete a resin which they can pour out at once as a balm or salve over the injury. This is but temporary however, and the plant heals the scar permanently by covering it even in young parts, with layers of cork, which begin to form at the margins of the hurt and gradually extend in to cover it completely.

HOW THE TREE REPRODUCES ITSELF. The life of the individual being limited, to perpetuate the race there must be some agency which will reproduce an individual like the parent. This is done by the flower. *All* trees have flowers though in some they are very small and inconspicuous. The essential parts of the flower are the pollen grain and the ovule. By a proper contact of the two, each being preferably taken from a distinct individual, there is formed a tiny single cell in the ovule which contains protoplasmic matter derived from both pollen and ovule, in other words, from two distinct parents; which is exactly the case also in the animal kingdom. This cell soon grows into the embryo which lies in the seed, and when the seed is planted, the embyro grows into the adult tree. Since the tree thus contains living matter derived from both parents, it is not like either of them alone, but shows characters of both. Nature has, so to speak, two sets of characters to choose from, and acting as usual optimistically, she selects the best, so that the offspring can be a little better than either of its parents. The tree can also be reproduced by slips or cuttings; but here there is living matter in the offspring from only one parent, which it must therefore closely resemble, varying neither for better nor worse.

HOW THE TREE MOVES. The adult tree cannot change its place, but if the same were true of its offspring, overcrowding would soon injure all. To provide against this, every tree at a certain stage is adapted, not to move itself, it is true, but to be moved by some natural agency. This stage is that of the embryo as it lies in the seed. The seeds of all trees are so formed as to secure wide scattering by means of the wind, currents of water and animals; and the study of the adaptation of seeds to this end is one of the most interesting in Natural History.

Such is an outline of the Physiology of the Tree. It will serve to show how much more Trees have in common with us than externals would suggest.

Cambridge, Mass. W. F. GANONG.

Forestry.

In European countries especially forestry is one of the important public concerns of the government. We will ere long be pushed to take an interest in it. But if we wait until we begin to suffer poignantly, we turn our attention to the matter too late. We lose advantages which would cost millions to restore. Our people have no conception of the great importance attached to this department in Germany, France, or even Norway. Our legislators are content to scheme as to how they can best secure their places of emolument; and for that purpose they watch the people and grant them what they appear to be most urgent in demanding. But they do not attempt to study the drift of undirected individual labor to make provision for the future. A prophet must arise from among the people and show them the future. Then the people shall ask, and, we presume, our needy legislating parasites will grant it rather than be carried off.

First and most important, we would suggest that all otherwise uncultivable land should be left in the forest and properly treated or replanted if already denuded. Advantages: A regulated supply of timber more valuable a few years later than now; a climate improved by collecting and storing more of our rainfalls and modifying the action of winds and extreme heat; and making the country beautiful by its forming more or less a combined park and natural history garden every here and there. All barren hill tops which, although fertile after their first cultivation, have now their elements of fertility washed away, should be covered with groves. Secondly, long expanses of plains should be broken up by narrow groves of trees running athwart the lines of the severest prevalent winds. And thirdly, road-sides should be lined with trees for ornamental effect as well as for general climatic influence. Just about the time Europeans commenced coming to America on their crusade of destroying trees, at home they began to protect and replant them. It is high time now that the hand of the destroyer in America should be directed by the dearly gained experience of older lands, so that the useful and necessary destruction of our forests may not be converted into useless and mischievous waste. The school-master must take the matter in hand.

Forests and Floods.

During this season of the year news of the sad havoc of floods come to us from many parts of the world; and even our own provinces, with their small river basins, often have their tales to tell of bridges borne down and property destroyed. But the floods, causeless, do not come. They form one of the scourges for the sin of our present civilization in neglecting the scientific study of our environment and the direction of selfish or unthinking individual effort. The effect of a heavy rainfall now, as compared with the one before our forests were cut down, can be seen from such a consideration as this. A four inch rainfall in a few hours then would be absorbed by the moss and vegetable debris of the forest, from which it would filter into streamlets, then into brooks, and lastly into the river. The river would rise gradually for a few days, then as gradually decrease. To a river basin fifty by twenty miles, such a rainfall would contribute over 50,000,000,000 gallons of water. The action of the forest surface would let that amount pass off in, say, five days. Thus the lower channel of the river would have to distribute only 10,000,000,000 gallons per day approximately. But when the land is cleared, the rain falls on the hard sod and rapidly runs off. It sweeps plowed fields and the dust and dirt of farm yards, roads, etc. into the streams, whose volume causes them to channel out the solid earth and hurl the valuable superficies of agricultural soil into the central turbid torrents within the space of twenty-four hours. The river channel has now to do duty for about 50,000,000,000 gallons in one day. So valuable property is overflowed and swept away, and the great hydraulic pressure tears up embankments and rolls Titan rocks before the flood. What might produce merely a clear swollen stream for a week in the olden time, now causes frantic, earthladen tornadoes of water which scrape down the hills and wash the plains into the sea. In round numbers, we can say that the annual rainfall in these Atlantic Provinces is about four feet, which is about 100,000,000 cubic feet, or about 600,000,000 gallons per square mile. The heavier the rain shower, of course, the greater are our present conditions against the proper utilization of the precipitation.

In the United States and in European countries, where large river basins are denuded of the forest, bridges have been built to withstand freshets unknown in the olden time; while during the most of the year the streams may be much lower and even altogether dry. For the mosses, etc., of the forest, as vast sponges, keep the rainwater on the surface of the soil sufficiently long to allow of the saturation of the earth from which innumerable springs arise to feed the streams during the whole year. But our civilization causes the valuable rains of heaven to be instantly precipitated into the salt sea, carrying with it violently the best of our agricultural soil to knead it into a greater rock cake for the making of future fields for agriculturists who may class our remains exhumed therefrom as the successors of the Mesozoic monsters. And thus our summer springs dry up, and our streams vanish, and drought withers our crops. So Sicily, once the granary of Rome, ran the race before us. So the agricultural environment of ancient Carthage, and the glories of the Orient faded in the trial of the tree destroying Turk. First the flood, then the famine.

Forests and Fish.

When our rivers and brooks ran through the primeval forest they abounded in fish. For age after age, before the tree felling animal intruded into these solitudes, these finny fairies disported themselves in the limpid moss filtered waters which rose and sank gently with the humidity of the changing season. But now at times the waters rage with unwonted fury, and the turgid wave is poisoned with mud and the washings of cultivated fields. This is a new condition of things which the gills of the sylvan fish were not accustomed to, and very probably were not very well adapted to. Then, when the flood was spent, the drought of summer dried up pools which formerly gave free sporting room for the hugest salmon in the driest season of the year. This is why our rivers have to be restocked. It is not the sportsman so much as the change in the fish's environment which is causing his disappearance. When the forests are cleared away the far famed Margaree of Cape Breton, the romantic Metapedia, and the prolific Fraser River, of British Columbia, will have their fish stories retailed only as legends.

It is very doubtful if man, with his schemes of close seasons and restockings, can offset the changed conditions of the country. We can try. But we must also prevent as much as possible stream pollution of every kind; and for other and weightier reasons try to moderate the floods and foster the hillside springs and the rain absorbing qualities of the earth.

Halifax. A. H. M.

Selections and Material for Arbor Day Programme.

RESPONSIVE READINGS from passages in the Bible, selected and arranged beforehand. (See Gen. I. 11, 12, 29, 30; Gen. II. 8, 9; Ezekiel XVXI. 3–10; Job XIV. 7–10; Psalm I; Psalm XC.; Hosea XIV.)

PRAYER.

RECITE IN CONCERT.

Children, thank God for these great trees,
That fan the land with every breeze.
Whose drooping branches form cool bowers,
Where you can spend the summer hours,—
For these thank God.

Reading of Inspector's notice setting apart the day; also requirements of school law.

SONG.

(*Air*—"Maryland, My Maryland.")

Again we come this day to greet,
Arbor Day! sweet Arbor Day!
With willing hands and nimble feet,
Arbor Day! sweet Arbor Day!
No sweeter theme our time can claim,
No grander deed points us to fame,
No day more proud than this we name,
Arbor Day! sweet Arbor Day!

Bring forth the trees! Prepare the earth
For Arbor Day! sweet Arbor Day!
With song we celebrate the birth
Of Arbor Day! sweet Arbor Day!
And when our joyful task is done,
And we our meed of praise have won,
The glorious work is just begun
For Arbor Day, dear Arbor Day!

—*Seymour S. Short.*

Recitations and readings.

RECITATION.

A boy strolled through a dusty road:
"What can I do?" said he.
"What little errand for the world?
I know—I'll plant a tree."

The elm's vast shadow far and cool
  Fell o'er the dusty way,
Blessing the toilers at their rest,
  The children at their play.

And panting horses felt the air
  Grow sudden full of balm;
Great oxen with their weary loads
  Caught there a sudden calm.

So little acts of kindliness
  Spread every branch and root,
And never guesses he who plants,
  The wonders of the fruit.

I often think if blessed eyes
  The old home scenes can see,
That heaven's joy is heightened by
  The planting of a tree. —*F. M. Butts.*

Selections from Tennyson, Wordsworth, Bryant and others.

RECITATION—ARBOR DAY.

What do we plant when we plant the tree?
We plant the ship which will cross the sea.
We plant the mast to carry the sails:
We plant the planks to withstand the gales—
The keel, the keelson, and beam and knee;
We plant the ship when we plant the tree.

What do we plant when we plant the tree?
We plant the houses for you and me.
We plant the rafters, the shingles, the floors,
We plant the studding, the lath, the doors,
The beams and siding, all parts that be;
We plant the house when we plant the tree.

What do we plant when we plant the tree?
A thousand things that we daily see;
We plant the spire that out-towers the crag,
We plant the staff for our country's flag;
We plant the shade, from the hot sun free;
We plant all these when we plant the tree.

Henry Abbey.

A recitation for nine little girls, four each to recite a long paragraph, and the short paragraph to be recited in concert by the other five.

THE DANDELION.

First girl recites:

There's a dandy little fellow,
Who dresses all in yellow,—
  In yellow with an overcoat of green;
With his hair all crisp and curly,
In the spring time bright and early,
  Tripping o'er the meadow he is seen.

Second girl:

Through all the bright June weather,
  Like a jolly little tramp
He wanders o'er the hill-side down the road;
Around his yellow feather
  The gypsy fire-flies camp;
His companions are the woodlark and the toad.

Five recite in concert:

Spick and Spandy, little dandy;
  Golden dancer in the dell!
Green and yellow, happy fellow,
  All the children love him well.

Third girl:

But at last this little fellow,
Doffs his dandy coat of yellow,
  And very feebly totters o'er the green.
For he very old is growing,
And with hair all white and flowing
  Nodding in the sunlight he is seen.

Fourth girl:

The little winds of morning
  Come flying through the grass,
And clap their hands around him in their glee;
  They shake him without warning—
His wig falls off, alas!
  A little bald head dandy now is he.

Five recite in concert:

O poor dandy! once so spandy,
  Golden dancer on the lea.
Older growing, white hair flowing,
  Bald head dandy now is he.

ESSAYS from subjects treated in this number of the REVIEW, and elsewhere.

VOTE — What tree shall be named and planted by those graduating or leaving the school this year.

VOTE — On a flower for the Province — Rose, Mayflower, blue violet, aster, golden-rod or other.

ADDRESS — By clergyman or some one appointed for the occasion.

TREE PLANTING.

Now a strong, fair shoot from the forest bring,
  Gently the roots in the soft earth lay;
God bless with His sunshine, and wind and rain,
  The tree we are planting on Arbor Day.

So may our life be an upward growth,
  In wisdom's soil every rootlet lay;
May every tree bear some precious fruit,
  Like the tree we plant on Arbor Day.

— *Arbor Day Manual.*

AT THE TREE.

Arriving at the place for the planting of a tree, everything should be found in readiness by previous preparation, so there may be no delay. By arrangement the tree should be dedicated to some particular person as decided upon beforehand. It would be well to have printed or painted on tin or wood and attached to the tree, the name of the person to whom it is dedicated, with date.

Place the tree carefully in position, as nearly as possible as that when found growing in its native place. Put in the earth carefully. See that finely pulverized earth is placed about the rootlets.

Teachers of District No. 10.

I wish you to notice the following proposed changes for next summer. By permission of the C. P I. it is my intention to spend the term in meeting you at convenient centres, in Teachers' Institutes, for the purpose of studying more practically the rudiments of Natural Science as laid down in the C. S. Board, and generally, best methods of teaching all subjects. The Institutes will be carried on somewhat after the model of the Summer School of Science. Where an instructor can be found, lessons will be given in the Tonic Sol Fa method. Circulars naming the different stations and giving full information will be sent to teachers about May 1st. To facilitate my plan, you will oblige me, by sending along with your winter returns, the fullest information possible as to what section you are removing, your successor's name, and names of teachers in surrounding schools. As this work will occupy the greater part of the summer, my visitation of schools will be confined to those whose teachers do not attend the Institutes.

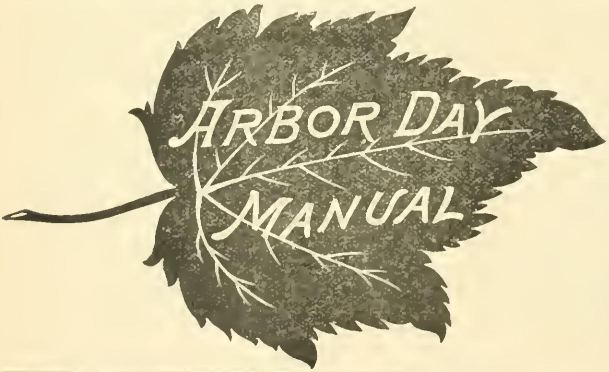
Our appeal to the teachers of Cumberland and West Colchester, on behalf of the "Children's Relief Fund," in the March Review, has met with a very generous, if not general response. Many teachers, because their schools can give only a small sum, are deterred from sending it. I trust that such a condition of things will not hinder their co-operation. The principle of the giving, in the largest and smallest sum, is the same. If each school averages but one dollar, we will have a respectable fund.

Principal Freeman and Staff, Amherst.	$45 00
" Ruggles " Acadia Mines, ...	25 00
" McKenna " Oxford, ...	30 00
Miss Corbett, Amherst Pt. S. Section, ...	6 50
" Lane, Wentworth Stn, "	3 10
" Charman, Little River, "	1 00
" Harrison, Salem, "	3 50
" Fulton, DeBert, No. 19, "	22 00
" Harvey, Brooklyn, Hants, ...	7 50
" Wallace, Ryan's Creek, Hants, ...	2 50
" Richardson, East Advocate, ...	2 40
" Trenholm, Lower Linden, ...	3 00
Mr. Arthur Cox, Newton's Mills, Hants, ...	3 00
Miss Sadie Fulton, DeBert (additional), ...	2 00
" Johnstone, Advanced Depart. Joggins School,	2 32
" Ryan, Primary " " "	2 00
" Glennie, Lower Wentworth, ...	1 60
" McKay, North Shore, Wallace, ...	4 75
" Doyle, Lower Shinimicas	2 65
" Dunn, Shinimicas Bridge, ...	4 00
" Corbett, Lakelands, Parrsboro, ...	10 00

Two of above contributions were raised before this fund was proposed. With those exceptions, Acadia Mines was the first received. I have to thank the teachers in Hants who are helping us. Will not every school in my District earn the pleasure of saying that it did something for the orphan children of Springhill?

Yours, E. J. Lay.

Amherst March 30, 1891.



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EDITORIAL NOTES.

ARBOR DAY will take place on the 15th of May in all the inspectoral districts of New Brunswick, except that of Inspector Brydges, where it occurs on the 8th.

MR. W. H. CULBERT, nurseryman, Sussex, can supply trees for Arbor Day, as will be seen by his advertisement in another column. Mr. Culbert's trees, as we can testify, are delivered in excellent condition and are healthy and make vigorous growers.

THE graduates this year from the several faculties of Dalhousie University numbered forty-two — larger than ever before in the history of the institution. The leader of the class was Miss Agnes S. Baxter, of Halifax, the first lady who has ever taken first rank honors in mathematics and physics and the Sir Wm. Young gold medal. The convocation proceedings, held April 23rd, were of a very interesting character.

THE new advertisements in this month's REVIEW are of interest to all our readers; that of Edward S. Carter, the publisher of *Progress;* S. F. Heustis, Halifax; C. E. Burnham & Sons, St. John; the Summer School at Harvard. Trustees especially should read the advertisement of Miss Barlow. The arrangement which she has designed and patented has received very warm commendationon the part of educationists.

MR. CHALMERS of the geological survey, Ottawa, in his recent report says of Mr. Wilson of the Leinster street school, St. John: "Mr. W. J. Wilson rendered me good service, and has now acquired such a knowledge of surface geology as to make him an efficient and valuable coadjutor in the work."

THE Annual Convention of the National Educational Association of the United States for the present year will be held at Toronto, Canada, July 14th to 17th. Most of the railroads have agreed to give half-rates, plus $2.00 membership fee to all who attend the meeting. Toronto people are making great preparations to welcome and entertain the visiting teachers, and numerous cheap excursions are being arranged to all important points on the great lakes, the St. Lawrence, and the seaside, after the convention. The official bulletin, containing programme for the meeting, railway arrangements, and all other particulars, is ready, and will be sent free to any one desiring it, on their dropping a post card to Mr. H. J. Hill, secretary local committee, Toronto. Among those who read papers are A. H. MacKay, Esq., of the Halifax Academy, and Miss Narraway and Miss Bartlett of the St. John High School.

We have it on the very best authority that there is a strong and generally expressed desire, not only on the part of City Boards but of County Trustees as well, that the summer vacation should be extended. The N. B. Board of Education must be aware of this from the number of applications it receives each year for an extension of holidays which, up to this time, have been uniformly refused. Both City and County Boards in a number of cases now take the matter in their own hands, and, of course, the teachers lose the Provincial grant for the extra days taken.

We hope the Education Department will see its way clear to take action in this matter for the present year, and at least extend the vacation in country districts to the second Monday in August, and in cities and towns to the last Monday in August. We would guarantee such action against complaint from any quarter.

SUMMER SCHOOL OF SCIENCE.

The Summer School of Science for the Atlantic Provinces of Canada meets next July in Antigonish. The fine new building of St. Francis Xavier college has kindly been placed at its disposal for the occasion. Antigonish will this summer be connected with all the Atlantic Provinces by the most direct lines of communication. The opening of the Pictou-Oxford branch of the I. C. R. makes a straight line of rails to St. John, and New Brunswick generally; and for Prince Edward Island it is only one remove from Pictou. The accommodations for the school will be good and inexpensive. The botanical *facies* of the district will be a change from that of the previous location of the school, giving all our botanists that great desideratum, a new ground for investigation. From a geological point of view the region is classic. The Arisaig coast displays so many well marked formations of the palæozoic age, first disclosed to the world by our late lecturer in geology, Dr. Honeyman, and yet receiving the attention of the geological survey of the Dominion, that our geologists must be delighted. The only regret on this point is, that the minutely accurate geological maps of the county, completed by the survey two or three years ago, owing to the peculiar judgment and temper of the deputy head at Ottawa, have not yet been published, and are only proposed to be published on a surface sixteen smaller than the maps of all the Cape Breton counties. A deputy has in such details, it appears, obstructive powers which even cabinet ministers may find it ticklish to deal with. We only stop to say that this and other points may soon be so clearly put to our people that the government may find no difficulty in dealing with the matter. In conclusion we must not forget to notice the proximity of the site of the school to the Alps of the Atlantic Provinces — not an inland Alps, but a maritime one, picturesque in its marine as well as in its freshwater lakes, missing only the glacier-flanked peaks of the old world — the island of Cape Breton.

COMPULSORY ATTENDANCE.

The Chief Superintendent of Education in New Brunswick in several reports has earnestly advocated compulsory attendance at school. In his last report he says that "the question is one so vitally related to the well-being of the country that it must continue to be pressed until some action is taken."

The Inspectors who, perhaps, are in a better position than others to estimate public opinion and appreciate the necessities of the school service, are, so far as they have expressed themselves—and some have done so again and again — unanimous in their advocacy of compulsory education. In their reports are such remarks as these: "Many children never attend school at all. In this connection my attention has repeatedly been called to the need of some scheme that would compel the regular attendance of all." "Attendance will never be satisfactory until we have a compulsory clause introduced into our otherwise excellent school system." "Anything like compulsory education would be strongly supported by the large majority of ratepayers in this district." "The best sentiment of this district is in favor of compulsory attendance at school."

The teachers of the Province at both County and Provincial Institutes have many times endorsed the principle of compulsory attendance, and trustees and school officers have persistently advocated it.

The most influential portion of the public press has given its adherence to the principle and has ably argued in its favor.

The Attorney-General of the Province, in a recent speech at Woodstock, while he did not commit himself in the matter, referred to the subject as one occupying the attention of the government, and expressed himself desirous of having the matter discussed by the representatives of the people.

It is to be earnestly hoped that the present session of the legislature will not adjourn without the matter of compulsory attendance having been brought forward for discussion at least. The details of such a scheme require mature deliberation, and in the adoption of such a measure the experience of other countries will be before our eyes. In Ontario, Nova Scotia and Prince Edward Island there is at the present time a compulsory clause in the school law. In Quebec, Manitoba and New Brunswick there is yet no such provision.

In the Province of Ontario a pamphlet has been printed by order of the Legislative Assembly embodying the experience of Canada, Great Britain, Germany and the United States in the matter. To this we may refer again.

In their advocacy of compulsory attendance, teachers and school officers cannot be accused of selfishness, as their already arduous duties would be greatly added to by its adoption. Earnest, ambitious and conscientious persons coming in contact each day with examples of carelessness and almost criminal neglect on the part of parents, and recognizing that each man is his brother's keeper, they do well to be outspoken. The very unselfishness of its strongest advocates strengthens the advocacy.

THE CHIEF SUPERINTENDENT.

We regret to notice that the rumour is revived that Chief Supt. Crocket is to be removed from office. We believe that it is only a rumour, and that the leader and men who compose the government of this Province are too broad minded to permit local or personal differences, if any such exist, to prejudice the educational interests of the whole Province.

No department of the public service is more sensitive at changes than that of education, and where there is a competent head none but the most weighty reasons could justify removal.

Supt. Crocket has for nearly all his life served this Province faithfully and acceptably as teacher, inspector and normal school principal.

The office of Chief Superintendent was not solicited by him, but was offered him as a recognition of his services in educational work. This principle of deserved promotion is one that the teachers should jealously guard, and any infringement of it would be resented by the whole body as endangering the educational interests of the Province and would be regarded by all as the inauguration of that system which has proved so detrimental to the school service of the United States.

TEACHERS' TRAINING.

Professional training for teachers has become a recognized necessity in all countries. Canada is fully abreast of the times in her recognition of this principle, and the people of New Brunswick can congratulate themselves on the fact that they employ few untrained teachers. In the neighboring State of Maine a majority of the teachers employed have no training of a professional nature. This does not arise from any want of appreciation, but from a lack of facilities for imparting such training. While we have a well equipped Normal School in New Brunswick, we are very far behind many other States and Provinces in the United States and Canada, not only as to the time devoted to professional training, but as to the scope and nature of the work in that department. The acquisition of scholarship should form no part of the regular work of a Normal School. The backward condition of our common schools at the time of the enactment of the present free school system, rendered it necessary that school work should form a part of the curriculum of study. After twenty years of free common schools we still find a large portion of the time of the student teachers devoted to the acquisition of scholarship and the examination papers of teachers so framed as to lay more stress upon this than on pure professional requirements. That scholarship is necessary, is admitted, but the examination for it should come before, not after, the student's admission to a Normal School, and we think that the condition of our schools now warrants these examinations as a preliminary to professional training. With the examinations as now given there can be no doubt but that anxiety to excel in mathematics, science, etc., subordinates to a certain extent the desire of the student to become a successful teacher of those branches.

EDUCATIONAL REPORTS.

We have just received the annual report of the superintendent of education on the public schools of Nova Scotia. It indicates continued progress. In the winter term of 1890, 2,142 teachers were employed and 2,109 schools were in operation; increase over the preceding year of 35 and 40 respectively. In the summer term the numbers were 2,287 teachers and 2,243 schools, an increase of 30 and 50 respectively.

The salaries of *first* class teachers, male and female, improved on the average by about *two* dollars per annum; while the salaries of the lower grades diminished from *one* to *three* dollars. Cumberland county had the best attendance at school, viz., 1 out of every 3.3 of the population by the census of 1881; 1 in 4.2 was the Provincial average.

There was an in increase of 423 pupils in the winter term over the 82,371 common school pupils of 1889. But there has been, according to the tables, a decrease of 857 in the number receiving lessons on health, and 5,754 on moral and patriotic duties, and of 273 on temperance. If statistics mean anything there was a backward movement during the winter in this department.

"Singing by note" diminished by 1,604, but "singing by theory" increased 1,797, an improvement in quality, if not in quantity as much as it should be. Grammar went back 30 and 61. Geography went back in grades III., IV., V., and VI. So did history, arithmetic, geometry, and some other subjects.

During the following summer term there was visible a great improvement on the previous summer. 3,615 more children received health lessons, and 4,023 lessons on moral and patriotic duties, and 5,201 on temperance. Lessons on nature were given to larger numbers; but there was still a decrease in geography in the lower grades, and a little in history.

But we cannot note a hundredth part of the thoughts suggested by these eloquent columns of figures. The high schools outside of the Academies appear to be giving less attention to drawing, agriculture, chemistry, geology; more to Latin and Greek; and less to modern languages.

The County Academies increase their libraries by 500 volumes. Income from fees diminished by 229, a decrease in every academy, except that of Halifax, which has nearly doubled. Salaries increased $454, and over $10,000 was spent on academic buildings. Marked increase in the number studying Latin and Greek.

These dry tables of figures are a mine of information as to the drift and rate of drift of our educational progress; and it is, therefore, specially important that the authorities should closely examine returns to see that there is uniformity in the interpretation of what each column calls for.

Several important and most desirable changes are foreshadowed in this report. We have on former occasions defended from our correspondents the very conservative action of the executive in making improvements. Evolution is better than revolution. We used to say: Retardation of evolution, however, is generally the visible prelude of revolution. We hope our apologies for the policy of delay in the past were not taken in any other sense. We shall hereafter be chary in emphasizing the good points in a Fabian policy. Come on with the reforms!

Gleanings from the N. B. School Report.

Last year St. Stephen made the highest percentage of attendance of any town in the Province.

Examination for license begins this year, June 9th.

Encœnia at the university comes on May 27th.

There are about 1,600 teachers engaged in teaching in New Brunswick. Of this number one-third change every term from one district to another.

First class male and second class female teachers are paid the highest salaries in St. John and Charlotte Counties.

First class female teachers are best paid in St. John and York.

Second class male teachers are paid best in St. John and Northumberland.

Third class male teachers are paid best in Charlotte and Carleton.

Third class female teachers are paid best in Northumberland and St. John.

Sunbury, Queens, Victoria and Madawaska pay the lowest salaries.

The total amount raised for the support of schools in New Brunswick last year was $415,550.79. This does not include the cost of buildings, furniture and apparatus.

There were 219 teachers examined for license in New Brunswick last year.

St. John Co. received the largest amount of money last year in aid of new school houses.

York Co. has the largest number of districts receiving poor aid.

There were 181 teachers who attended the Educational Institute at Moncton last year.

St. John Co. has the best attended County Institute. The attendance last year was 156.

In 1888 there were 6,571, in 1889, 4,970, and in 1890 there were 4,040 trees planted on Arbor Day in New Brunswick.

The Stanley medals for professional standing were won last year by Miss Annie Moore, of Fredericton, and Miss Minnie C. Edgar, of Chatham, N. B.

There is a feeling on the part of some teachers that grammar and first-class licenses would be attainable much more easily if the examinations were so arranged as to include only a portion of the subject each year or term.

To a hard working teacher the additional labor of study for an advance of class is very great. If after two years of teaching, satisfactory to the Inspector—as is now required—the examination for an advance of class were divided into three parts and the candidates were allowed to pass, each at different times, we would have more grammar and first-class teachers. Surely this is desirable. To the average teacher, the examination, as at present, looks so heavy that he hesitates to attempt it in addition to his other work; but if it were spread over, say two or three years, it would appear feasible, and no interest would suffer. We hope our educational authorities will take the matter into consideration.

Our Normal Schools devote but one year to a course which has been shown to be not purely professional. Similar institutions devote as much as three years to a purely professional course. Few of our students reach the top of the ladder by one year's attendance, and many of our first-class teachers attend longer or acquire skill by experience to enable them to a higher grade. While it would be desirable to have a longer Normal course, the time is not ripe for it yet in these Provinces and we must make the most of what we have. We can improve by making the course a purely training one; and it does not follow that subjects of our common school course should be eliminated from our Normal School curriculum, but that the time should be devoted, not so much to the acquisition of knowledge, but *how* that knowledge may be best imparted.

On the Early History of New Brunswick.

BY MOSES H. PERLEY.

A portion of a lecture delivered before the Mechanics' Institute, St. John, in 1841; now for the first time published.

(Continued from April number.)

The first party of Loyalists that arrived, landed at the present Market Square, cleared away the dense forest then standing upon it, & with ships sails made hurricane houses, under which, with their women & children, they got the best shelter they could. On the day of their arrival, they were all regaled with fresh salmon, which were caught in great numbers in the harbour, and which were furnished the new comers at the standard price of 7½d. each. The whole of this City was then in a perfect State of wilderness; the wood was dreadfully thick and greatly encumbered with windfalls.

Each man as he arrived drew one of our City Lots, which he forthwith proceeded to clear, and the next operation was to put up a log-house. I am indebted to David Hatfield Esq. almost the sole survivor of those who arrived here in May 1783 for many particulars connected with the arrival & settlement of the Loyalists, for which I beg to tender him my thanks.

Mr. Hatfield tells me he drew a lot in the Lower Cove, near the present Marine Hospital, and that he cut down upon it with his own hands, spruce trees 15 Inches in diameter. In June another fleet arrived, and vessels continued coming all the Season, and in the succeeding winter there could not have been less than 5000 Inhabitants on a spot, which a few months previously had reposed in the Silence and Soltitude of the primeval forest.

The disbanded soldiers of the 42d. Regt. drew their lots chiefly upon Union Street, and they erected almost a continued line of log Houses from York Point to the back Shore. At the east end of Union St, at the back of the Block House, and all around the back Shore, there was a thrifty growth of spruce, very large and handsome trees. King's Square was then a very thick Cedar Swamp, and I have heard several amusing anecdotes from persons who had been lost in its labyrinths, one in particular of an inhabitant who wandered about in it, one whole day, in search of his lost cow. King Street was partially settled the first winter. The Father of the present Messr. Sears drew the lot on King Street where their hat store now stands, and I well remember the late Mr. Sears telling me in his life-time that the surveyor went with him, to show him his lot in the bushes, and that after some search, they found the right blaze on a spruce tree at the corner of the lot; that he pulled off his coat, hung it on the corner tree, and with his own hands proceeded with a heavy heart to cut down the trees, & endeavour to establish for himself a house in the wilderness.

In 1783 Major Studholme was Commandant at Fort Howe, having under him Captain Balfour and a party of troops. Each loyalist on his arrival, was furnished by Govt. with 500 feet refuse boards, with which to make a shanty, until they could get up a log-house. With the first arrival of Loyalists Colonel Tyng came as Agent, and with him Commissary Hart —the latter occupied the House and Stores of Mr. Simonds at Portland point, where rations were furnished the new comers. But notwithstanding these and other arrangements for their comfort, great distress and misery were endured by this noble band of loyal spirits, and their suffering wives & children. Many died the first winter from the small pox, fever & other diseases, induced & aggravated by the want of shelter and other privations.

When we consider that these truly loyal men, had to brave, for the first time, the horrors of a long & bitter winter, in hovels, barely sufficient to shelter their shivering limbs from "the pelting of the pitiless storm", in a dreary region, with scarcely a human habitation to be seen, to struggle with difficulties and privations incalculably severe, & without an object on which the eye could rest, save dismal swamps, frowning cliffs and dark interminable forests, have we not reason to admire their cheerful submission, their indomitable perseverence, their devoted patriotism?

In a dispatch dated 30th Sept. 1783, Gov. Parr stated to the Colonial Minister, that the number of Loyalists who had arrived in Nova Scotia up to that time amounted to 18,000 & three weeks after he reported the arrival of 2000 more. Major Studholme's account for furnishing lumber and erecting houses for the Loyalists, between the 1st day of June and the 31st day of December 1783, amounted to £6,721 6 6 which amount was allowed & paid him by Government.

In the summer of 1874 more persons came from the United States, while many of those who had arrived the preceeding year, moved up the River from this place to farms which had been allotted them, & on which they settled. The building of wharves in the harbour was commenced this year *(1784)*. That Spring, a weir was built from Portland Point to York Point, and the quantity of fish taken in it was almost beyond belief. On one occasion, the gaspereaux lay, knee-deep, for three rods back from the weir, all the way across from Point to Point. The weir was scuttled in three places, to let the fish out; yet of the immense quantity which remained, a large portion spoiled, from the impossibility of taking care of them, as well as for the scarcity of salt. Salmon were very abundant this year, yet the price advanced to ninepence each. For two years after this City was settled, the Inhabitants did not follow the exact line of the Streets, but used paths along the most convenient places according to the nature of the ground. The City, at that time was divided into two settlements, the upper Cove and the lower Cove, which for a long period, carried on a violent opposition to each other. The Lower Cove was almost wholly cleared up the first year; the principal business establishments were placed there & it had much the greatest population.

The two settlements of Upper and Lower Cove were divided by forest for some time, and all the carting and carriage between the upper and lower part of this City, was carried on by the beach at low water--along by Pettingell's Yard and Reed's Point. This way was very rough & difficult, particularly where Mr. John Walker is now building the splendid new Custom House. There the beach was encumbered with large masses of rock. Dock Street was for a long time, only a narrow foot path, along the edge of a rocky cliff, and people passing along it, were obliged (particularly in winter) to hold on to the small bushes and roots which clung to the rocks to prevent them slipping off, and rolling down upon the wild & rocky beach beneath them. At low water, they went over to Portland by crossing on the flats from York Point to the Point where Messrs. Harris & Allan's Foundry now stands. It was three years before a Bridge was got across. There was no road leading out of Town for some time—the only outlet was by a path along the bank of the Marsh Creek. There were 3 or 4 houses on the marsh, one back of Lily Lake, and one at Indian Town in 1783.

In the summer of 1784, a fire burned all the wood off the lower part of the Town as far up as Princess Street. Some log houses were burned, and the rest were saved with difficulty. (They had no water-pipes, or fire plugs then). The value of City lots at this time was from 10/ to £5. Mr. Hatfield tells me that the lot at the Coffee House Corner was held at 15 Guineas. but being considered too high did not find a purchaser. Many lots on King St. were sold for a Jug of rum, and Mr. John Clark the baker, also an old loyalist, tells me, that he could have had as many lots as he wished in the Lower Cove, by paying for the deed and standing treat — and that in fact some of the valuable lots he now holds were acquired on those terms. The first vessel built in this harbour of St. John was built exactly where the New Market House now stands, and was a brig of 160 Tons. Coasters this year flocked to the St. John in tolerable numbers, and by the kindness of the Sheriff of St. John, I am enabled to show the original Custom House Book from Novr. 1783 to Oct. 1784. On 9th Feby. 1784 Wm. Tyng, James Peters & George Leonard were appointed Judges of the Inferior Court of Common Pleas for the County of Sunbury.

But this vast and variable Country was not destined to remain much longer a county of Nova Scotia, the whole of which it so greatly exceeds in extent.

On the 16th Aug. 1784 a Commn. issued under the Privy Seal to Thomas Carleton Esquire appointing him Captain General & Govr. in Chief of the Province of New Brunswick, the boundaries of which (the same as at present) were defined and established by Commission. On the 22nd day of Novr. 1784 this commission was received & promulgated at this place, and the first entry in our Council Records is as follows,—

"Parr Town, 22 Nov. 1784."

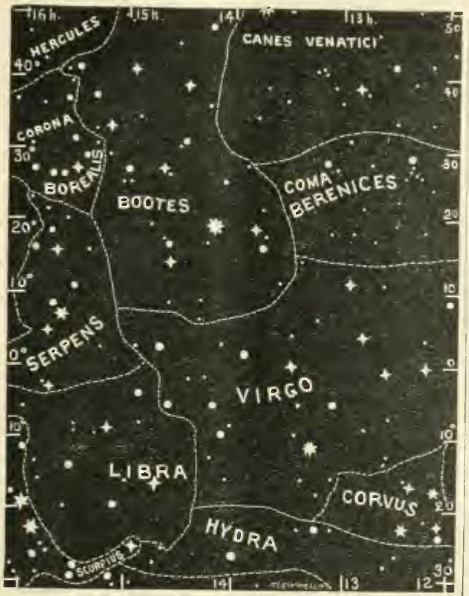
His Majesty's Commission above recited, constituting and appointing Thos. Carleton Esq. Captn. Genl. & Govr. in Chief of this Province, having been duly published, His Excellency repaired to the Council Chamber where he took the Oaths by law required and administered the same to George Duncan Ludlow, James Putnam, Abijah Willard, Gabriel Ludlow, Isaac Allen, Wm. Hazen and Jonothan Odell, Esquires, they being the number nominated in the Kings Instructions to be of His Majesty's Council for this Province; and then the Govr. and the members above named having taken their seats in Council, a Proclamation of the Govr. was read notifying the boundaries of the Province as established in the Kings Commn. and commanding all Officers civil & military to continue in the execution of their respective Offices.

Advised that the said Proclamation be this day published.

(To be continued.)

Of all trees the *Eucalyptus amygdalina* of Australia is the tallest, reaching a height of over four hundred and fifty feet. The *Sequoia gigantea* of California is the largest as regards total bulk, if we exclude the banyan. The most useful trees are the palms. The smallest, and in many ways the most interesting, is *Welwitschia mirabilis* of South Africa, which, while attaining to a great age, does not attain a height of more than two feet. It has only two leaves, which are persistent cotyledons, and it bears cones extensively, not unlike those of our spruces. The oldest trees are baobabs of the east, cypresses of Mexico and dragon-trees of Teneriffe. Some of these are known to have attained an age of over four thousand years.

Astronomical Notes.



Here are some constellations that are well placed for evening observation at this time of year. If you know some of them already, you can work your way from the known to the unknown ones at any time that you can see them. But if you know none of them, you will find it easiest to begin an acquaintance with them when they are placed as your map represents them. This is when they are "on the meridian,"—on an imaginary line running from the south point of the horizon up to the zenith. It is when "on the meridian" that a star is at the highest point of its daily journey across the sky.

On May 22nd the stars along the right edge of the map will be "on the meridian" at 8 p. m., mean time, and those along the left edge at midnight. Half-way between these hours, 10 p. m., will be the very best time on that evening for the novice to compare his map with the sky. But the moon will be nearly full then, and she will be among the stars at the lower left corner of the map; so that evening will not be a particularly good one for star-gazing. But you will find the stars in the same position on any other evening if you change the hour on the 22nd by four minutes for every day between it and the evening you select. For example: Whatever is the position of any star at 10 p. m. on May 22, the same will be its position at 10 30 on May 14, at 9.30 on May 29, at 9 on June 6, and so on. At any of those hours then — or of the corresponding hours on other days — compare the stars on your map with those on and near the meridian. Facing south, and running your eye downward from the zenith, you will see the stars along the the middle of the map from the "14" at the top to the "14" at the bottom.

The two eight-point stars are easiest to recognize. The upper one, which is much the brighter, and is reddish or yellowish in color, is Arcturus; the lower is Spica. Arcturus is the chief star in the constellation Bootes and is therefore called Alpha Bootis. For a similar reason Spica is called Alpha Virginis. On the map Spica is nearer to the bottom than Arcturus is to the top, but when on the meridian in the sky this is not so. For latitude 45°, the top of the map goes 5° farther than the top of the sky (the zenith), but the bottom of the map is 15° above the bottom of the sky (the horizon.)

To the right of Spica note the four stars in Corvus. The quadrilateral they form is a well-marked object, and it is a good thing to have as many as possible of such easily recognized sky-marks.

Those two four-point stars in Libra are easily found in the sky as the two most conspicuous objects to the left of Spica. The lower one is Alpha, the upper Beta. Do you think that is the order in which you would have named them? Put your glass on Beta and see if you can detect the "beautiful pale green hue," which Webb finds in it. Try Alpha next, and then add it to your list of easy doubles, but don't speak of it as a "double" to an astronomer or he will laugh at you. That one to the right of Beta is a variable — its name is Delta Libræ. It will be at one of its extreme phases at 10:20 a. m. on May 16, at 9:45 on May 23, and at 9:10 on May 30. (These hours are 60° time.) Which extreme — whether maximum or minimum — you can determine by observing it at these times, and again on the evenings between the given dates. Another variable is one of those three in Hydra, just below the boundary line between Virgo and Corvus. This one — R Hydræ — is a long period variable like Mira; Delta Libræ is a short period one like Algol. When R Hydræ is at maximum it is the second brightest of those three; when at minimum it is invisible. Which is it at now?

Away below and to the left of those three — outside the map altogether — you will see Theta Centauri, that bright and rather solitary star. Nearly as far below it as it is below Spica we would see — if we were down in the West Indies — the star which is the nearest to us of all the stars, and which is brighter than any we ever see, except the Dog star; and to the right of it — down below Corvus — we would see the Southern Cross.

In Virgo note the row of stars curving up and to the right from Spica — first a dot and then a couple of four-point stars. The dot is Theta Virginis, the next one is Gamma, and the one near the edge of the map is Eta. Another, Beta, lies just outside the map. Gamma is the brightest of these and is a famous "binary" star, that is, a double whose components revolve about each other. "Very easy," says Young of this double, but he means for a telescope not for a field or opera glass. The moon's track runs very close to Gamma at present, and a series of occultations of it will begin in September. The two stars above Gamma are Delta and Epsilon, and the other four-point one to the left is Zeta. Note the right angl ewhich these three make.

Half way between Spica and Beta Libræ you will see the middle one of a bent row of three stars. On the map the two above are big dots and the lower one a little dot. On the sky there is not that much difference between them. The middle one is Kappa. About half way between it and Spica a faint dot should be distinctly seen by a good eye on a clear, moonless night. That dot is the planet Uranus.

Of Serpens only a part is shown. As a whole the constellation is not an easy one to pick out in the sky, but that X up near Corona is easy, and should be put down among your sky marks. It is in the Serpent's head. The six-point star below it is Alpha Serpentis.

Corona has figured in recent Notes, and so has Coma. In Canes Venatici the four-point star is King Charles' Heart, and it also has been noticed lately as forming a large diamond with Arcturus, Spica, and Denebola. Denebola is just outside the map, at the right edge, where the southern boundary line of Coma runs.

Bootes — called Boots by some irreverent people — is too fine a constellation to be disposed of in a few lines at the end of an article. Its turn will come some other time.

Yarmouth, N. S., April 26, 1891. A. CAMERON.

For the REVIEW.]

Kindergarten Methods in Primary Schools.

SEVENTH PAPER.

The first six gifts are solid, and now the next step is the transition to the plane. The *seventh* gift consists of tablets generally made of wood, but they may be of pasteboard. The shape is of two kinds, square and triangular. The latter are again divided into four kinds of triangles.

In preceding gifts the child has dealt with solids— made of them houses, chairs, etc.; but with the tablets, he will only be able to make pictures of these.

Square tablets are given first, and with six or eight of them nearly all the forms of the third gift are produced. After square tablets are understood, then the right-angled isosceles triangle is introduced. It is shown that it is really a part of a square tablet.

We generally use two colors of tablets, light and dark, blue and orange, or red and green, etc., as the main idea in making forms is to "*keep the opposites alike.*" The law of opposites is not spoken of, but a lopsided figure is no more beautiful than a lopsided object. Children soon learn to apply this law, and to *think* this way as well as to *work.* "We cannot think of *light* if we have not known *darkness.* If we think of *goodness*, the opposite quality, *evil*, presents itself immediately to the mind. Without this law there would be no true comparison."

In the first lesson on tablets we call attention to the one-inch cube of the third gift, and have, or cut from a potato or apple a similar cube. With a knife slice this up, wishing all to watch you while you work. Ask them what you are doing, and some one will be able to tell you that you cutting the cube into slices. Then talk about this slice, its shape and of what it is made, then give to each one wooden tablet to measure. They find that it fits in the ruled desk just as the one-inch cube did. Now give to each enough of the tablets to make a cube, thus forming the parts into a whole again. They know now where these tablets come from, *i. e.*, that they are really parts of a cube. Taking two tablets, ask one to place them so that that the corners will touch, so that they will touch by edges.

Give two tablets to each child, and they soon find out that they will not make a square form, but may be placed in a number of different positions.

Three tablets given to each next lesson will make a number of forms, and at the close of each lesson allow them to draw the pictures of the forms on the board. These tablets are the basis of drawing.

Very pretty forms are made of four tablets of one color and four of another. Only a few forms of life can be made, as a hat, a table, a gate, a chair, a cross, and a few others; but a great variety of forms of beauty (symmetrical forms) may be made.

Now, triangular tablets are introduced, and at first a square tablet (of clay, apple, etc.), is cut in two, to show where these triangles come from. Children are very much interested in these triangles, and readily see that two triangles of this kind make a square. Alone or combined with the square tablets many pretty forms may be made.

One interesting lesson comes in here about *corners* and *angles.* We generally speak of the angle as the inside corner. The name square or right angle is given to the inside corner whose outside corner will fit into the ruled square on the desk. In the triangular tablets the sharp corners have little angles inside. These terms are taught here because when we come to the sticks of the eighth gift we make use of them when figures are dictated. We might wish the sticks laid on the desk to be inclined at a small or big angle. Children easily learn these words because their little fingers are doing the work at the time we talk, and they do not memorize them.

Now that grades I. and II. use tablets, as prescribed by the course of instruction and as spoken of in Prang's Model Book, I think the *plates* accompanying "'The Paradise of Childhood," by Edward Wiebé, would be of great use to primary teachers. The book may be purchased of J. L. Hammett, 24 Cornhill, Boston, price $1.50. In the *plates* spoken of there are 200 forms made with tablets.

M. Olszewski has found that liquid oxygen, instead of being colorless, has a bright blue color. He concludes that the blue of the sky may be due to the air's oxygen

For the Review.]

To be Read to Pupils.

Boys and girls, you all like to hear of brave deeds. You have heard the story of the terrible explosion at Springhill, that carried death through the dark passages of the coal mines, and made so many fatherless children. I saw twelve of those orphans in grade III. the other day. There were too many brave deeds done in that awful time, to tell you of in one letter, so you must be satisfied to hear of the boys. Danny Robinson, fourteen years old, had charge of one of the horses that draw the boxes of coal in the mines. Danny was driving along, sitting on the empty box, when he saw a flash of flame coming towards him. In a second a great blast of wind followed. His horse fell dead, and he was thrown back into the box, terribly burned and half stunned. Climbing out of the box after a bit, he started for a place of safety, for the roof was falling around him, when he heard his little trapper, Jud Terrice, calling for help. (Your Royal Reader, No. IV., will tell you what a trapper is.) Danny turned about and ran towards the cries, tearing off his burning clothes as he went. He found Jud under the door, which had kept off the flames. Then Danny tried to pick him up, but his hands hurt too much, then to get him on his back, but Jud would slip off. At last, as Danny told me, he just got him under his arm (poor arm! shrivelled up by the fire), and ran to the pit bottom. Dropping Jud he was about to run back after his own brother, but the men would not let him, and carried him up to the pit's mouth; and you will be glad to know that his brother was there, all right. Danny is getting better now, and if you want to hear how he is at any time, just write to some of the Springhill teachers. Some of them talk and read to him; and, I dare say, take him something good to eat, as you would do, if you were there. What would you like to do for Danny? Could we not give him a medal, bought with some of the children's relief fund money? There was another Dan, older than the last, still only seventeen, not much older than some of you. This boy, Dan Beaton, had a brother working in the pit. Dan was getting his lamp fixed when he heard the explosion, a long piece away. Catching his shirt in his teeth, to keep out as much as he could of the choke damp, he ran along the dark tunnel one thousand feet to where his brother lay unconscious and on fire. Picking him up Dan ran back over fallen stones and dead horses to a place of safety. I did not see this Dan, but I did see his brother, who is almost well again. He will not soon forget Dan, will he? (Ask your teacher about the damp, or carbonic acid, and at recess measure one thousand feet along the road, and see how far Dan had to run along that dark tunnel, where to linger was to die.)

I wish I could tell you that all the boys found rescuers. Others were saved, two by their horses falling upon them, and so keeping off the flames, while all around dead men were lying, but more than twenty were taken home dead.

But I have talked too long to-day; so I will stop by asking you all to go right to work, not acting but being heroes, Your teacher can tell you how; but I just want to say that if you want to be honest, and truthful, and pure, as all heroes must be, you will have great battles all along the road. Whether you are fond of fighting or not, I want you to take that road of honesty, truth and purity. People may not write about you in The Review, but you will have brave deeds to do, and be real heroes all the same. Perhaps the editor will give you a corner to yourselves in The Review in which you may ask questions of him, or of your sincere friend,

Stahlfeder.

What a Live Teacher is Doing.

Dear Sir: Please find enclosed one dollar, subscription to The Review. I like The Review much; find it a great help in teaching. The lessons on Practical Chemistry and the Metric System alone are worth to the live teacher more than the cost of The Review for one year. We had a concert in our school, and we realized enough to get the chemicals and chemical apparatus to enable us to take the course in practical chemistry. We hope to be to work at it soon now. Trusting you may receive all the encouragement necessary to make The Review just what teachers need,

I am, yours truly, H. T. C.

Messrs. Editors: Will you accept of a few, simple lines intended to recall to the minds of our teachers and pupils some thoughts already expressed in the columns of The Review. Your very valuable Arbor Day issue, will, I feel sure, stimulate many teachers and pupils in their laudable efforts to beautify and improve school premises. I. B. Oakes.

Horton Academy, Wolfville.

Say, what have you done, when you've planted a tree
By the side of the street, or on the broad lea,
On the school ground so bare, or the green cottage lawn,
Where the hours may pass 'mid mirth-making song;
You have spread o'er the school, o'er the lawn and the street
Many air-cooling fans, many odors most sweet.

Every branch overstretched is a hand full of good,
Full of beauty and strength, full of shelter and food.
Every leaf that may flutter, fans the worn passerby,
Cools the heat of the sun that burns in the sky,
Joins the music it plays on the zephyrs so low
With the carol of birds that sings on its bough.

What, then, have you done, when you've planted a tree?
It teaches grand lessons for you and for me,
The tree rises upright, seeks a kingdom above,
Stretches hands toward heaven for its hourly food,
Rejoices alike in the sunshine and rain,
Gently chiding the heart so apt to complain.

It lives and it moves, has its being in God,
Breathes the breath that we breathe, though it clings to the sod,
Has a true circulation, assimilates food,
Yields to physical laws, loves to do good,
Loves cultivation, to make its life grand,
Giving beauty and health to its own native land.

What, then, have you done when you've planted a tree
Near the street, near the school, on the lawn, or the lea?
You offer to birds, in the days that will come,
A home and a place where to nurture their young.
You beautify school, garden lawn, village street,
Furnish moisture for health, and an atmosphere sweet.

The tree speaks God's plan in the broad leafy wood,
Which promotes vegetation, saves the river from flood,
Saves the country from desert, from late spring and frost,
That threaten with danger, desolation and loss.
Then plant a memorial, more lasting than stone,
That will tell of your deed after life's work is done.

I. B. O.

Childhood of Charles Linnæus.

(Translated from the French of Louise Colet by Helen F. More.)

One evening in the winter of 1719, the chimney of the parsonage in the village of Rocshult, a poor dwelling scarcely distinguished from the surrounding huts, cast into the heavy icy air a column of black smoke. Within burned a huge turf fire. The pastor and his family, which consisted of the pastor's wife, an excellent housekeeper, two little girls of seven and eight years, and a boy who might be about twelve, were seated around a table for the evening. On this table blazed a low, large iron lamp, with three burners. At the foot of the lamp were heaped large balls of brown wool which the mother was knitting into stockings. The wooden knitting-needles clicked in her fingers; the two little girls strove eagerly to imitate their mother's task, and succeeded well. The pastor, with his elbows resting on the table, and his head bent over a large Bible, read from it now and then passages on which he commented.

The whole attention of the little boy, whose fair hair fell over his forehead and eyes, was absorbed by a copy-book of blank paper, in which he was fastening plants and flowers. His little sisters sometimes looked at him by stealth, but without interrupting his work. As for his mother, she cast a fond look upon him from time to time, accompanied by a smile, but with her eyes constantly glancing at her husband, the minister, who continued his learned and pious reading without raising his eyes towards his auditors. But suddenly he shook his great head with the obstinate face, and, after looking at his son, he cried angrily:

"Still these copy-books and these good-for-nothing plants! I am determined to throw them all into the fire to make an end of your idleness and disobedience."

As he made a motion to execute his threat, the child pressed his book closely to his breast, and crossed his arms over it, while his mother checked her husband and said:

"Have patience, my good Nilo. He only wanted to arrange the plants he had gathered to-day, and now he is going to attend to his Latin tasks;" and she hastened to put away the threatened copy book and to bring out instead the book of exercises and translations.

"Woman, in trying to excuse him you accuse yourself," cried the pastor, still angrily. "You speak of the plants he has gathered to-day. Yes, I know very well that instead of writing his exercises at home or accompanying me to the beds of the sick and dying, he has been groping about under the snow, and running like a little vagabond among the mountain passes to look for what? — I ask you that — for nameless and useless plants!"

"Nameless they may be," replied his wife, who was as ignorant as himself of botany; "but there are some which are both useful and wholesome. The other day, for instance, when our little Christina cut her finger, a few leaves of one of these plants were enough to stop the bleeding. Then, again, when our old cousin Bertha burned herself so dreadfully some time ago, it was again the plants that Charlie pointed out that cured her. The village doctor, whom she called, declared that this dressing of herbs was good; that it must be continued, and that whoever had prescribed it knew what he was doing."

"At all events," replied the father, "as I do not wish to make my son a doctor of medicine, but a doctor of theology, — a minister of the church like myself — he will for that end have to give up this ridiculous herbal, and devote all his time henceforth to the study of the Holy Scriptures and of Latin. Otherwise I can assure him that before another week I shall send him to the Latin school in the village, where he will live under a harsh rule."

The mother was about to reply, but the pastor silenced her by his gravity, and, bending over his Bible, continued his reading in a low voice.

Nothing was to be heard for a while in the smoky room, which served at once for kitchen, parlor and dining-room to the pastor's poor family, but the sound of the knitting-needles of the mother and the two little girls, and the fainter sound of the pen of the boy who was writing his Latin translation.

He threw himself into his work with an absorption and a rapidity which was almost feverish. It was evident that he wished to do well and quickly an uncongenial task. When he had done he heaved a sigh of relief which interrupted the universal silence.

"Well," said the pastor, raising his head which had been weighed down by reading, meditation, or possibly by a half doze.

"There, father," said the child, placing beside the Bible the written pages.

The father ran his eye over them immediately, and when he had finished he murmured:

"Good, very good! I know, Charlie, that you can do whatever you choose. That is why I blame you the more when you are disobedient."

"I will obey you, said the child, looking at his father with an expression of tenderness and supplication; "but could you not let me divide my time into two parts; one for the study of good books and of Latin, the other for the study of plants and flowers, which to me are so many psalms and hymns singing the greatness of God?"

"You are crazy!" cried his father. "I have already told you that this childish study will come to nothing, and will interfere with your theological career. If you persist you know my resolution on the subject, and I will not depart from it."

With these words he rose and commenced the prayer which the family made together each evening. Then the children, having kissed their father and mother, went to bed. Charlie slept in a dark closet, which had for its sole furniture a bed, a chair, and a set of deal shelves, on which were arranged a few books and the beloved herbal.

Hardly was he in bed when he began to weep and to think over ways of following his beloved vocation without disobeying his father.

While he was still in tears his mother came secretly; she kissed and comforted him.

"My darling," said the good mother, holding Charles in her arms, "it grieved you very much, then, not to be able to go any more through the snow and among the rocks, looking for the hidden plants."

"O, mamma, if you knew how delightful it is when I find a new kind; to admire it, to count the roots, the stems, the leaves, the flowers, the petals—each feature, in short, of these treasures of the good God! It is in the spring above all that this keen delight is varied and multiplied. The newly opened flowers are for me a complete world, such as the arch which encloses the whole animal creation would be for others. The plants speak to me, and I understand them. I assure you, mamma, that they have instincts, habits and differences in the same species just as the faces of my sisters and myself are different in spite of our resemblance."

"You are dreaming, you are dreaming, my dear child" cried the mother, half laughing and half moved. "But in this terrible cold, and with the hardness of the earth, your pleasure must be greatly lessened. You take a great deal of trouble to secure a slight and sparse result."

"O, mamma! Ask the hunter if he fears the snow which falls on his shoulders; ask the fisherman if the ice banks stop him. They only see the prey which they pursue, and which they bring home in the evening."

"You will live and you will eat; only you will eat your breakfast an hour sooner than usual," replied his mother, gayly, "and every morning while your father is still sleeping you will go to your dear discoveries. But you must never stay beyond the allotted time, and at the appointed hour you must return at once to study your Latin."

"O, thank you, thank you!" cried the child, throwing himself upon his mother's breast, who kissed him and left him, saying: "Wait till to-morrow."

For the first time in his life the child went to sleep radiant with joy, and had a beautiful dream. He thought that he was suddenly transported into an immense valley surrounded with mountains, which commenced in a gentle slope, and gradually rose till they reached the skies. He was seated beside a beautiful, clear fountain which murmured among the plants and flowers of all sorts. It was summer, and the great white and gold clouds drifted through the intensely blue ether above his head. He had never seen such a sky in the poor, Swedish village in which he was born, and which he had never quitted. His admiration was divided between the sky, where the sun shone in all his glory, and the smiling country, covered with flowering shrubs and plants. He rose and began to walk, enchanted and alert, through the paths. He feared to touch a twig, a leaf, a petal, a stamen, and yet he wished to gather, one by one, each of these flowers in order to study them. At first he eagerly inhaled their perfumes, and enjoyed the sight of their beautiful forms and their exquisite tints. Then, seized with a sort of vertigo, he cried:

"Never can I fix in my memory this innumerable variety of species to classify and name them."

In his discouragement he stopped motionless, and praying inwardly:

"My God! my God!" he cried, "nature is too great for the weak sight of man, and if ever he attains to a knowledge of the outward, its depth and its details would escape him. Thou hast made, O my God, creation in Thine own image, and we, poor, puny creatures, would measure its grandeur and describe its beauty — it is impossible! We know but fragments of Thy work, the remainder escapes us. Forgive, then, my audacity, O God! My father is right. I ought to adore and serve Thee as a humble minister, and not endeavor to know thee and explain Thy works like a wise partaker of Thy divine nature."

The poor child, crushed by the splendor of nature which surrounded him, fell on his knees praising God, and remained long in an ecstasy.

But voices, which seemed the voice of God Himself, rose suddenly from the open calices of the flowers, and from the bosoms of the still unfolded buds. These voices cried to him:

"Come to us, we are thine We love to have thee love us and seek us, to understand that we live and feel — we who have been for so long believed lifeless, inanimate and capable only of pleasing the eye. Do not fear to gather and destroy us; we shall be born again without pain. Each of our severed fibres will teach thee mysteries hardly suspected hitherto. Thou wilt find in the details of our structure as many wonders as that in the human body; for, on a different scale, we have, like mankind, an organization that suffers and rejoices. We have our habits, our manners, our imperious destinies fixed by unfailing laws. Look at and understand us, thou child who lovest us. Thou shalt know how we are born, how we develop, and how we attain to beauty and love."

It was not only the large and magnificent flowers of the tropics which spoke — the cactus, the nenuphar, the magnolia. Neither was it alone the queen flower of the garden — the rose, the tuberose, the lily, the carnation — which spoke thus to the sleeping child. It was also all the little wild flowers — the daisy, the violet, the thyme, the buttercups, all the mosses and all the lichens growing on the rocks or beside the water. Each plant, each stem, each calix had, as it were, a distinct voice, and all these accents united, formed a sweet and soothing harmony which plunged the little Charles into a delicious enchantment.

"O, yes," he cried, in answer to these mysterious words, which he alone could hear, "I love you, I understand you, and I will reveal to the world the grace and the splendor of your secrets."

He bent over the nearest flowers to gather them, but, behold, a miracle suddenly took place around him! All the flowers seemed to move and to tear themselves from their roots. They came toward the child, made a fragrant inclosure around him, mounted to his heart and to his arms, then to his head, where they entwined themselves into an immense crown.

The face of the child shone transfigured beneath this emblem of a glorious feature. He grew rapidly beneath this coronation of his beloved flowers. Suddenly he felt a warm breath glide across his face. A kiss touched his face, and caused him an indescribable happiness. The sensation was so vivid that he awoke. He saw his mother standing near him, half visible in the first ray of sunshine. The kiss came from his mother, his mother who understood his soul.

(Concluded in next issue.)

The following sums have been received for "Children Relief Fund": Miss McKenzie, Byers Section, New Annan, $2.57; Miss Chrystal, primary department, Campbelltown, $1.25; Miss Archibald, Debert River, $9.00; Miss Stevens, Advocate, $2 50; Miss Sayre, Nappan, $13.50; Miss Bowser, Lower Cove, $1.50; Miss Gillis, Mt. Pleasant, $1.25; Miss Anderson, Northport, $3.57; Miss Clarke, Maccan, $4.50.

E. J. Lay.

Manual Training in the Halifax County Academy.

That the Halifax Board of School Commissioners is leading in the matter of educational reform and enterprise is illustrated by the following item of business transacted at the regular monthly meeting, 30th April last. We quote from a morning paper:

The following report from the special committee on manual training (Ald. Power, chairman), was adopted and the committee authorized to carry it out:

Your special committees on manual training in the schools of this city beg to report as follows: "The subject of manual training in the public schools is now receiving great attention in the most progressive cities of Europe and the United States, and your committee consider that it could be most advantageously introduced into the Halifax school system. Manual training does not mean teaching any trade in schools, but rather instructing in those principles which lie at the root of all trades. The pupils of these training schools are taught the use of tools in the best sense of the term; accuracy, patience, thoroughness, form, style, causes and effects. Experience on the continent of Europe shows that the pupils from the manual schools acquire quicker, easier and much more thoroughly any art or trade—more especially arts or trades calling for exercise of the reasoning or inventive faculties—than the ordinary youths.

And, more important still, by the teaching and example of such schools the dignity of labor is asserted; and that mistaken but unfortunately prevalent idea that he who labors with his hands as well as his brain is not the equal of the professional man or the man of leisure, exploded, perhaps, more effectually than otherwise.

Theoretically less important, though possibly practically more so, is the fact that a practical knowledge of the commoner tools and of their uses, and of mechanical principles, cannot fail to be of a very great advantage to men of all classes and stations in countries such as this.

In many cities of the United States these manual schools exist, hence it is easy to devise from their experience a plan or scheme suitable to Halifax. In the opinion of your correspondent an annual grant of $1,500 would, for some time, defray all the expenses of such a school in this city. The tools and appliances are not expensive, and could be added to from time to time. A room which, with some alterations, would doubtless prove very suitable for the classes to work in, is at present unused in the high school building. Probably the greater portion of the needed $1,500 could be obtained from outside sources, and the school board has some as yet undeveloped sources of raising revenue. Your special committee consider the scheme for a manual school of moderate but useful extent one that the Halifax school board can undertake and carry out without unusual inconvenience or effort.

At the beginning, in such a school little would be taught beside wood working, its principles and use of its tools. Work on iron and stone would follow after the school was well under way; also the study of machinery, engines, and mechanics generally. The experience in these schools, as in most other affairs, is that the success of the enterprise depends largely on the teacher or head of the classes. Good and suitable men can be obtained and their number is annually becoming greater.

Believing that this school should be undertaken — and as well now as at any later date — your committee recommend that one of the board officials — preferably the supervisor — be sent to personally visit, and in fact inspect thoroughly and repeatedly, some such school in practical operation — for instance, Boston — and to thoroughly acquaint himself with the methods, courses of study, and cost of material, etc. Also, and more particularly to seek for, see, and open negotiations with a desirable and highly efficient teacher — not necessarily a low-priced one — willing to instruct the pupils of our city schools. Also, that this or some other committee be instructed to communicate with the provincial government as to the special grant which, it is understood, they will give the proposed school, and to use all means in their power to acquire information, and to carry the proposed scheme to a successful issue.

Music in Public Schools.

About 250 schoolmistresses were told how musical instruction should be imparted to their pupils by Mr. Frank H. Damrosch at Music Hall, Fifty-seventh street and Seventh avenue. The audience was the Association of Principals of Primary Departments and Schools of New York City. Mr. Damrosch said, "musical instruction should begin in the lowest primary class, and should comprise besides a number of rote songs, a thorough drill in the major scale and the relation of the sounds contained therein to each other. Starting from this foundation the instruction should continue in such a manner that at the end of three years in the highest primary class each pupil should be able to read any song in simple rhythm in any key at sight." The programme, he said, for the whole course in schools should be: For the first three years ten minutes a day; second three years, fifteen minutes three times a week; last two years twenty-five minutes twice a week. He also advocated the appointment of a general superintendent of music.—*N. Y. Sun.*

There is some one, or more, in every grange, who would be glad to find a place for and take care of 200 or 300 young trees until they were large enough to set out by the roadside. Such trees can be bought in great variety at small cost from wholesale nurseries. A few dollars invested in this way every year by the grange would soon give us all the shade trees we could possibly use and make all our country roads beautiful. Don't be afraid of starting out small. A horse chestnut, planted by a little boy on his ninth birthday, has grown in twenty years to be a tree more than twenty feet high, and has given the boy and man great pleasure every year in watching its steady growth. The little trees will grow while we are sleeping, and before we realize it they will be yielding a grateful shade and the birds will be singing in their branches. —*C. H. Mann, Essex County, Mass.*

PERSONAL.

Mr. E. H. Balkam has resigned the office of school trustee of Milltown. It is to be hoped that he has not ceased to be secretary of the Board. Mr. Balkam has been identified with the schools of Milltown since the passage of the school law, and has taken a more active interest in them than perhaps any citizen of the town, which owes much to his energy and foresight in school matters. While he had strong convictions in educational matters, they were always progressive. In him the teachers had a friend and the community a most zealous and efficient school officer.

AMONG THE SCHOOLS.

Miss Webber of the Ledge and Miss Thompson of Crocker Hill, Charlotte County, have raised about $60 each for the purpose of procuring school libraries. We hope to hear of many more such efforts in this direction.

Through the efforts of the teachers and pupils of Lancaster No. 1, St. John County, the sum of $20 has been raised for the purpose of providing the school with a flag and flag-staff. The teachers are James S. Clark and Kate Armstrong.

Faculties of engineering, mining and applied science are reported as likely to be added to the University of Dalhousie before the opening of the next year.

Howard Murray, B. A., (London), senior classical master in the Halifax Academy, has been appointed a lecturer and examiner in classics in the University of Dalhousie. The appointment will not interfere with his academic work.

R. J. MacDonald, B. A., (Dal.), late editor of the medical department of *Dalhousie Gazette*, has been appointed to the vice-principalship of Albro street school, Halifax.

Morris street school, Halifax, under Principal Creighton, is developing its physical and calisthenic drill into military form, steps having been taken to form a regular cadet company. In the Halifax County Academy, over two hundred have been drilled twice a week during the past term in military and calisthenic movements, and they are now quite proficient.

At the Pictou Academy terminal examination the highest honor — the gold medal — was won by Miss Blanche MacDonald, of Hopewell. The silver medal was won by D. A. Fraser, of New Glasgow. The following numbers in each year presented themselves at the examinations: 1st year, 29; 2nd year, 36; 3rd year, 22; 4th year, 7. Total, 94.

At the Truro Academy the gold medal was won by Miss Lillie Meehan. Miss Mary King took second place and lead in mathematics. Total number at terminal examination, 90.

At the Halifax Academy the terminal examinations were conducted by means of printed examination papers, the Greek papers being as beautifully set up by the Nova Scotia Printing Company as if they were done in London. The results of the fourth year examination will be announced later, prior to graduation exercises at the end of June. At examination: 1st year, 102; 2nd year, 62; 3rd year, 32; 4th year, 15. Total, 211. One hundred and ten candidates wrote at the entrance examination for the summer term, of whom forty-eight were admitted.

The Victoria School of Art and Design is being transferred to the Halifax County Academy building, thus affording a magnificent opportunity for the study of art in connection with the ordinary academic branches. The change will improve the accommodations of the institution very materially, as the rooms are much more commodious than those with which it started. It has the following departments: Freehand and Model Drawing; Mechanical Drawing; Architectural Drawing; Painting; Modelling and Sculpture.

Geo. A. Cogswell, late principal of the River John high school has been appointed to the staff of the Truro Academy in place of E. Smith resigned.

We are glad to learn of the recovery of Principal Calkin of the Nova Scotia Normal School from a severe illness.

The agricultural farm and the normal school were visited by the Provincial Assembly's education committee.

Professor Smith of the agricultural school read a very valuable paper on "Fertilizers in Red Sandstone Soil" before the Nova Scotia Institute of Science, Halifax, in April last. It gave the results of experiments on the farm during the past two years.

The schoolrooms of the famous Boston High School are 24x32x14 feet, with an allowance of 268½ cubic feet for an average attendance of forty pupils.

QUESTION DEPARTMENT.

CENTREVILLE.—Please solve the following questions in trignometry.

I. $\tan 18^\circ = \dfrac{\text{Sin } 33^\circ + \text{Sin } 3^\circ}{\text{Cos } 33^\circ + \text{Cos } 3^\circ}$

II. $\tan \dfrac{x}{2} = \dfrac{\text{Sin } x}{1 - \text{Cos } x.}$ (Should be $\dfrac{\text{Sin } x}{\text{Cos } x - 1.}$)

I. From formulæ $\text{Sin } A + \text{Sin } B = 2 \text{ Sin } \frac{1}{2}(A+B) \text{ Cos } \frac{1}{2}(A-B)$

$\text{Cos } A + \text{Cos } B = 2 \text{ Cos } \frac{1}{2}(A+B) \text{ Cos } \frac{1}{2}(A-B)$ we have

$$\frac{\text{Sin } 33^\circ + \text{Sin } 3^\circ}{\text{Cos } 33^\circ + \text{Cos } 3^\circ} = \frac{2 \text{ Sin } \frac{1}{2}(33^\circ+3^\circ) \text{ Cos } \frac{1}{2}(33^\circ-3^\circ)}{2 \text{ Cos } \frac{1}{2}(33^\circ+3^\circ) \text{ Cos } \frac{1}{2}(33^\circ-3^\circ)} = \frac{2 \text{ Sin } 18^\circ \text{ Cos } 15^\circ}{2 \text{ Cos } 18^\circ \text{ Cos } 15^\circ} = \frac{\text{Sin } 18^\circ}{\text{Cos } 18^\circ} = \tan 18^\circ$$

Q. E. D.

II. From formulæ, $\text{Sin } A = 2 \text{ Sin } \frac{1}{2} A \text{ Cos } \frac{1}{2} A$ and $\text{Cos } A = 2 \text{ Cos}^2 \frac{1}{2} A - 1$, we have

$$\frac{\text{Sin } x}{1 - \text{Cos } x} = \frac{2 \text{ Sin } \frac{x}{2} \text{ Cos } \frac{x}{2}}{1 - (2 \text{ Cos}^2 \frac{x}{2} - 1)} = \frac{2 \text{Sin } \frac{x}{2} \text{ Cos } \frac{x}{2}}{-2 \text{ Cos}^2 \frac{x}{2}}$$

$$= -\frac{\text{Sin } \frac{x}{2}}{\text{Cos } \frac{x}{2}} = -\tan \frac{x}{2} \text{ i. e. } \tan \frac{x}{2} = \frac{\text{Sin } x}{\text{Cos } x - 1}$$

MERIGOMISH.—Please solve problems 22 and 23, Ex. XXV. page 157, Todhunter's Algebra for Beginners.

22. Let x=no. of lbs. free, xy=charge in pence per lb. of luggage not free. The two passengers have $2x$ lbs. free, therefore 5 cwt. less $2x$ lbs. pay y pence per lb., which amounts to 5*s.* 2*d.* and 9*s.* 10*d.*=62*d.*+118*d.*=180*d.* And 5 cwt.=560 lbs. (English weight). And 19*s.* 2*d.*=230*d.*

The two passengers have $(560-2x)$ lbs. to pay for.

The one passenger would have $(560-x)$ lbs. to pay for.

$$\therefore \left.\begin{aligned}(560-2x)\,y &= 180\\ \text{and } (560-x)\,y &= 230\end{aligned}\right\} \qquad \begin{aligned}&(1)\\&(2)\end{aligned}$$

(1) ÷ (2) $\qquad \dfrac{560-2x}{560-x} = \dfrac{180}{230} = \dfrac{18}{23}$ (3)

(3) Cleared of fractions, $12880-46x=10080-18x$ (4)

(4) Transposed and collected, $-28x=-2800$ (5)

(5) ÷ -28, $\qquad x=100$ *Ans.*

23. Let x=distance in yards which A ran in 5 minutes at the rate of y yards per minute, B ran only $x-50$ in 5 minutes at the rate of $\frac{2y}{3}$ yards per minute.

But distance divided by rate gives the time.

Therefore $\dfrac{x}{y} = 5$ for A (1)

and $\dfrac{3(x-50)}{2y} = 5$ for B (2)

(2) ÷ (1) $\qquad \dfrac{3(x-50)}{2x} = 1$ (3)

(3) Cleared of fractions and expanded, $3x-150=2x$ (4)

(4) Transposed and collected, $x=150$= distance. (5)

Sub. (5) in (1), $\dfrac{150}{y}=5 \therefore 5y=150 \therefore y=30$yds=A's speed and $\frac{2}{3}y = \frac{2}{3}(30)=20$ yds.=B's speed.

WM. H. D.—Please solve the following in your next issue:

$$\frac{x+\sqrt{(12a^2-x)}}{x-\sqrt{(12a^2-x)}} = \frac{a+1}{a-1} \qquad (1)$$

(1) Cleared of fractions, $(a-1)x+(a-1)\sqrt{12a^2-x} = (a+1)x-(a+1)\sqrt{12a^2-x}$ (2)

(2) Transposed, $(a-1)\sqrt{12a^2-x}+(a+1)\sqrt{12a^2-x} = (a+1)x-(a-1)x$ (3)

(3) Collected, $(a-1+a+1)\sqrt{12a^2-x} = (a+1-a+1)x$ (4)

(4) Further collected, $2a\sqrt{12a^2-x}=2x$ (5)

(5) ÷2, $\qquad a\sqrt{12a^2-x}= x$ (6)

(6) Squared, $\qquad a^2(12a^2-x)= x^2$ (7)

(7) Expanded, $\qquad 12a^4-a^2x = x^2$ (8)

(8) Transposed, $\qquad -x^2-a^2x = -12a^4$ (9)

(9) ×(—1), $\qquad x^2+a^2x = 12a^4$ (10)

(10) Square completed, $x^2+a^2x+\left(\frac{a^2}{2}\right)^2 = 12a^4+\frac{a^4}{4} = \frac{49a^4}{4}$ (11)

(11) $\sqrt{}$ extracted, $\qquad x+\frac{a^2}{2} = \pm\frac{7a^2}{2}$ (12)

(12) Transposed and collected, $x=-\frac{a^2}{2}\pm\frac{7a^2}{2}=3a^2$ or $-4a^2$ (13)

Ans.

or, by a shorter method.

In (1). Difference of numerator and denominator divided by their sum in 1st member is equal to the same in the second member. (Theory of proportion).

$$\therefore \frac{2\sqrt{12a^2-x}}{2x} = \frac{2}{2a} \qquad (2)$$

(2) Cleared of fractions and simplified, $a\sqrt{12a^2-x}=x$ (3)

(3) Squared and transposed, $12a^4=x^2+a^2x$ (4)

(4) Square completed, $12a^4+\frac{a^4}{4}=x^2+a^2x+\left(\frac{a^2}{2}\right)^2$ (5)

(5) $\sqrt{}$ extracted and transposed, $x+\frac{a^2}{2}=\pm\sqrt{\frac{49a^4}{4}} = \pm\frac{7a^2}{2}$

(6) Transposed and collected, $x=\pm\frac{7a^2}{2}-\frac{a^2}{2}=3a^2$ or $-4a^2$.

Ans.

GRIP. 1. Kindly answer in the question columns of the May issue of the REVIEW the following questions:

1. Write the different ways in which each of the nine digits can be made up of two less numbers.

2. Write a scheme or synopsis of the tenses of the Indicative Mood in the Passive Voice of the verb laugh. As you know the verb laugh is intransitive, but is used, sometimes, transitively by the addition of a preposition such as at. What I really want to know is, When you are writing a scheme of it in, say both voices, or more particularly the passive voice, must the preposition that is added to it in its transitive use be written also? For instance, I am laughed sounds very awkward, but I am laughed at sounds

more harmonious. Instead of writing the synopsis, perhaps you would find it more convenient to answer this question, by just stating whether the preposition is to be used in the scheme in the passive voice or not.

1. We give this problem to our readers.

2. The two words "laughed at" forms *one* transitive verb.

Inquirer.—I wish, through the Astronomical Editor of the Educational Review, to gain a little information. In regard to the Lunar Cycle and the Solar Cycle, as mentioned in the front of the almanacs, I have solved the first problem, by adding 1 to the present year, 1891, and dividing by 19, which gives a remainder of 11, which corresponds with the number given in the almanac and Book of Common Prayer. But how to get the 24, the number given in the almanac, the present year, for the Solar Cycle, I want to know. Will you please publish the reply and oblige?

Add 9 to the year and divide by 28. Thus the remainder from $\frac{1891+9}{28}$ is 24.

M. V. S.—In the March number of the Review the answer to "Tom's" question: "What territories of the U. S. have become states within the last five years?" is incomplete. The four mentioned are not the only ones, Wyoming and Idaho were both admitted to the union in 1890, making in all forty-four states.

McS. What are these Lycopods?

No. 1. *Lycopodium complanatum* L.—a depauperate variety. No. 2. *L. dendroideum*, Michx. No. 3. *L. annotinum* L. No. 4 (?) Variety of *L. dendroideum.*

County Academy Entrance Examinations, 1891.

Arithmetic and Algebra.

1. Explain the meaning of the following terms and give examples of each: Quotient, Divisor, Remainder, Product, Factor, and write in words the number expressed by the following figures: 1203050725002.

2. Define Common Measure, greatest Common Measure, Common Multiple, Least Common Multiple. Find the L. C. M. of 21, 56, 75, 84.

3. Write "Avoirdupois weight" in full, and express 9 ac. 1 ro. 29 poles, 6 feet 64 inches as the fraction of a square mile.

4. Define Decimal Fraction, Circulating Decimal, and find the cost of .275325 of a ton of sugar at 7½ cents per lb.

5. What will it cost to build the cellar wall of a house 40 ft. long, 30 ft. wide, at 32c. per cubic yd., the wall being 10½ feet high and 18 inches thick.

6. A drover exchanges 48 sheep for 192 lambs, when 12 sheep are worth $96. Find the difference between the value of 9 sheep and 9 lambs.

7. The sum voted at the annual meeting, in a certain section, for the support of the schools was $1000. After deducting $85 for poll-tax the balance is to be assessed upon the property of the section, the valuation of which is $145,000. What will be the tax on the dollar, and what is A's tax, his property being valued at $12,230?

8. A sum of money put out at simple interest for 3 years at 6 per cent amounted to $855.50; to what sum would it have amounted had it been lent at compound interest?

9. Find the difference between $a-b+c-d$ and $a-y+c-z$.

10. Find the continued product of $a+b$, $a-b$, $x+y$ and $x-y$.

11. Divide $x^5-2x^3-2x^2-3x-2$ by x^2+2x+1.

GRAMMAR.

1. Place in a list those of the following nouns which have grammatical gender, and supply with each the corresponding masculine or feminine form, according as either is wanting: Bird, hero, inventor, songstress, executor, executioner, widow, boy, sultana, emperor.

2. Distinguish between qualifying and limiting adjectives, and give at least three illustrations of each in short sentences.

3. (1) Define "Voice," and distinguish between the voices. (2) Write the corresponding passive or active form (same mood, tense, number and person) of each of the following verbs: Lovest, wast loved, wilt love, (if he) love.

4. Explain for what purposes the verb "be" is used as an auxiliary.

5. Define the term Extension as used in analysis and state—
   (1) Its chief grammatical forms.
   (2) Its principal kinds or classes.

6. Parse:
   Warsaw's last champion from her height surveyed
   Wide o'er the field a waste of ruin laid.

7. Analyze:
   This is the malt that lay in the house that Jack built.

GEOGRAPHY.

1. What are Latitude and Longitude? From a place whose longitude is sixty degrees west, and whose latitude is forty degrees north, we go south sixty-five degrees and east one hundred degrees, what latitude and longitude do we now reach?

2. In what direction from Halifax is Annapolis? Cape Canso? Charlottetown? Yarmouth? Sable Island? St. John?

3. Describe the shortest water route between Montreal and Calcutta.

4. Describe briefly the rivers of Quebec, and give the boundaries of any *two* of the following: Italy, India, Algeria, Mexico, Ontario and New South Wales.

5. In what countries and on what rivers are the following cities: Fredericton, Winnipeg, New Westminster, New Orleans, London, Liverpool, Glasgow, Paris, Dublin, Limerick, Hamburg, Vienna, Lisbon, Khartoum?

6. Write a short description of the British Empire?

7. Name the States of the American Union, giving the capitals of those on the Atlantic seaboard.

8. Tell what you know about the Austro-Hungarian Empire.

9. Draw an outline map of South America, filling in as many details as you can.

USEFUL KNOWLEDGE.

(Ten questions will be considered a perfect paper.)

1. What is the most useful metal? Why is it the most useful, and where is it obtained?

2. How does a liquid change to a solid? a solid to a liquid? a liquid to a gas?

3. What is a magnet? Describe the mariner's compass.

4. What precautions would you take in a thunderstorm in order that you might not place yourself in unnecessary danger?

5. What part of the turnip is used? the strawberry? cabbage? mustard? potato?

6. What is a coin? Of what metals are coins usually made?

7. Tell what you know about icebergs?

8. How do you obtain the following: Common salt? petroleum? camphor? maccaroni? opium?

9. How do you account for the presence of marine shells on the top of some high mountains?

10. What is a ruminating animal? Name the chief ruminants?

11. Describe as fully as you can the metamorphoses of one of the following: Butterfly, frog, grasshopper.

12. Name the senses, distinguishing between those that require contact and those which at a distance inform us of the presence of their bodies.

13. Write a short note on oxygen.

14. What is a volcano? What volcanoes are best known?

15 Describe as fully as you can (1) an insect that is useful to man; (2) one that is noxious.

16. Give as many reasons as you can why you should not use tobacco.

BRITISH AND CANADIAN HISTORY.

1. Name the first three sovereigns after the conquest, with the dates of their accession Relate the story of Thomas Becket.

2. Describe the character of any *two* of the following: Richard I, Henry VIII, Charles II, William III, George III.

3. Tell what you can of the following battles: Crecy, Bosworth, Blenheim, Bunker Hill, Culloden, Alma, Aboukir Bay.

4. Assign each of the following events to the reign to which it belongs: Gunpowder Plot, Great Plague of London, Battle of Bannockburn, Battle of Flodden, Destruction of the Armada, The South Sea Bubble, American Civil War, Repeal of the Corn Laws, Catholic Emancipation Act.

5. State what you know regarding the settlement of (1) Lunenburg, (2) Pictou.

6. Describe briefly the following battles: Chateaugay, Chrysler's Farm, and Lundy's Lane.

7. Explain the following: Responsible Government, Quebec Scheme, National Policy.

Charles Alfred Hamilton, M. D., C. M., of the Victoria General Hospital, reports a new species of *Callitriche* for Nova Scotia in Guysboro county. *C. verna* L, *C. intermedia, Wild, C. aquatica,* Bigel are all probably the same species, and are found in Canada. Dr. Hamilton's species is very much like *C. heterophylla* Pursh, of more southerly habitat.

There are 400,000 teachers in the public and private schools of the United States.

The school attendance in N. B. in 1890 was 1 in 5½ of the population.

BOOK REVIEWS.

MECHANISM AND PERSONALITY, an outline of philosophy in the light of the latest scientific research, by Francis A. Shoup, D. D., Professor of Analytical Physics, University of the South; pp. XIV. + 343; 7½ inches by 5½; Cloth, $0,50. Ginn & Company, Boston, U. S. A., 1891. Concise in treatment, popular in presentation and up to date, it is a book for the man of general education who cannot afford to read much special literature on the subject.

THE NEW FOURTH MUSIC READER, designed for the upper grades of boys and mixed schools and containing chord-work, exercises, and part-songs with and without words for a capella singing, by Luther Whiting Mason, formerly Supervisor of Music in the public schools of Boston, Mass. Ginn & Co., Boston, 1891. A capital book in the regular musical notation.

HYGIENIC PHYSIOLOGY, a text-book for the use of schools, by D. F. Lincoln, M. D., late Secretary Health Department of American Social Science Association; author of "School and Industrial Hygiene," etc. Cloth, 5 × 7½ inches; pp. IV. + 206; $0.90. Ginn & Company, publishers, Boston, U. S. A., 1891. The printer has done his work well, and the author has also. Nowhere do we remember having seen any treatment of the subject, more clear, and better illustrated in so small a compass.

LESSONS IN ASTRONOMY, including uranography. A brief introductory course without mathematics, for use in schools and seminaries, by Charles A. Young, Ph. D., LL. D., Professor of Astronomy in the College of New Jersey; author of a "General Astronomy for Colleges and Scientific Schools," and of "Elements of Astronomy for High Schools and Academies." Cloth, 5 in. × 7½ in.; pp. IX. + 357 + 8 (Star maps). $1.30. Ginn & Co., Boston, U. S. A., 1891. Typographical execution superior. Treatment of the subject admirable. We were about describing the work as popular, but it is more. It is a most accurately scientific presentation of modern astronomy so far as it can be apprehended without a knowledge of more than common school mathematics It is a popular astronomy with a compendium of the latest results of astronomical research.

IMMENSEE von Theodor Storm, with English notes and a German-English vocabulary; DER FLUCH DER SCHÖNHEIT, Novelle von W. H. Riehl, edited for the use of schools; DER. GEISTERSEHER—Schiller. Three books published by D. C. Heath & Co., Boston, New York and Chicago. Apart from their splendid adaptation to high school and college, these books are just the reading to be relished best by the self-taught student of German The vocabulary, notes and good print of portions of the best German literature, in 25-cent form, is one of the advantages of the present over the past.

A TEXT-BOOK OF EUCLID'S ELEMENTS, Part II, for the use of schools, containing Books III. and IV.; by H. S. Hall, A. M., formerly scholar of Christ's College, Cambridge. MacMillan & Co., London and New York, 1891. This is Euclid put in its neatest and most effective form, with a capital selection of exercises and modern geometrical ideas.

Plato—Gorgias. Edited under the supervision of John William White and Thomas D. Seymour. pp. IX. + 308, 6 × 8 inches; $1.75. Ginn & Co., Boston, U. S. A. and London, 1891. This is truly a superb specimen of a Greek text-book. The introduction gives an excellent sketch of the beginning of Greek rhetoric, Gorgias' life and activity, the aim and principle of the dialogue in the book, its scenery, place, time and plan, with an exact summary of its subject matter. The fine Greek text is accompanied with numerous and full notes, making the book a very fascinating one for any student of Greek.

The American Citizen, by Chas. F. Dole; published by D. C. Heath & Co., Boston. This is a work that will be useful to the student everywhere, suggesting as it does topics of interest in the growth of citizenship.

Sprague's Shakespeare: Merchant of Venice and Macbeth, edited with notes by Homer B. Sprague, Ph. D. S. R. Winchell & Co., publishers, Chicago. This edition of Shakespeare has some excellent features which must commend themselves to the teacher and student. The notes are arranged upon the principle of stimulating thought; it gives results of the latest etymological and critical research; it gives the opinions of some of the best critics on almost all disputed interpretations; and it presents the best methods of studying English literature by class-exercises, by essays, and by examinations.

Mademoiselle de la Seiglière, a comedy in four acts, with introduction and English notes. Publishers, D. C. Heath & Co , Boston, Mass.

Scott's Lady of the Lake, with introduction and notes, by G. H. Stuart, M. A. Price 2s. 6d.; Shakespeare's Coriolanus, with introduction and notes, price 2s. 6d. Publishers: MacMillan & Co., London and New York. These two works are carefully edited and neatly printed and with the excellent notes should be of great service to students.

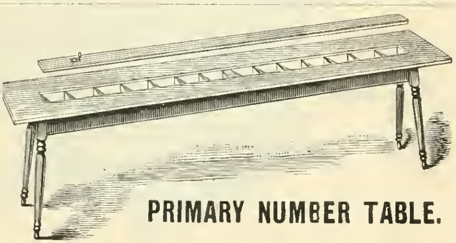
Twelve English Statesmen: Peel, by J. R. Thursfield; price 2s. 6d. Publishers: MacMillan & Co., London and New York. An admirably written account of Sir Robert Peel and his times, in which we have pen portraits of other eminent statesmen.

Elementary Classics: Xenophon's Anabasis, Book III, for school use, with notes, vocabulary and maps, price 1s. 3d. Published by MacMillan & Co., London and New York. An excellent work for schools, the Greek text being especially clear.

Classics for Children: Irving's Alhambra; Scott's Marmion; price 50 cents each. Publishers: Ginn & Co., Boston. This cheap and excellent series of books by the Messrs. Ginn should have a wide circulation. They are well printed, in good sized type, handsome pages with explanatory notes at the bottom.

Current Periodicals.

The *New England Magazine* for May possess more than usual interest for Atlantic Province readers. The article on the Loyalists by James Hannay, illustrated by Lewis A. Holman, is one that will be read very generally.... *Littell's Living Age.*—*The Living Age* for April 24th and May 2d contain John Wesley, *Nineteenth Century ;* The Anabaptists and their English Descendants; The Influence of Democracy on Literature; The Fair Ophelia of a Highland Glen, *National ;* An Irish Landlord, and Archæological Nomads in Rugged Cilicia, *Blackwood ;* A Village Obituary, *Gentleman's ;* and others. For forty-two numbers of sixty four large pages each (or more than 3,300 pages a year) the subscription price ($8) is low; while for $10.50 the publishers offer to send any one of the American $4.00 monthlies or weeklies with *The Living Age* for a year, both postpaid. Littell & Co., Boston, are the publishers.... *Garden and Forest*, New York, is very seasonable in its directions for tree planting, laying out grounds and hints on gardening and horticulture. ....The *Popular Science Monthly* for May contains: "New Chapters on the Warfare of Science," "Fortifying Against Disease," "An Experiment in Moral Training," "My Garden on an Onion," "The Education of Children," and other valuable articles....We are glad to notice the enlargement of the Halifax *Critic*, which indicates a growing patronage. Its sound, intelligent and manly British-Conadian tone, we are glad to see, has won for it an enduring place in the history of our journalism and in the affections of our people.



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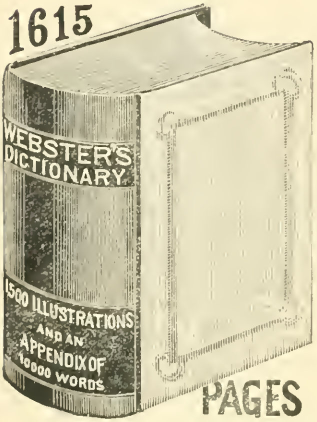

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A Special Announcement of the Faculty of Applied Science

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